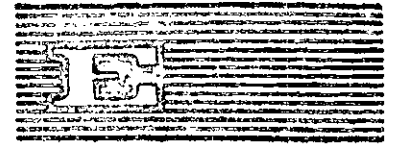


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Agricultural development in Latin America

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Chapter I

PRESENT SITUATION

Over and over again the Economic Commission for Latin America (ECLA) has drawn attention to the critical state of agricultural development in Latin America.^{1/} Its principal symptoms and causes may be summed up under the following heads: (a) a slow rate of increase of production, especially in the livestock sector, in relation to the rate of population growth; (b) little improvement in unit yields of a large number of products and, as a general rule, inadequate technological progress in most countries; (c) an unsatisfactory structure of production, characterized by under-diversification; (d) over-concentration of ownership of land and agricultural income, with the result that the income levels and levels of living of vast numbers of the rural population are deplorably low; (e) under-utilization of available land and labour, giving rise to high unemployment and under-employment figures in rural areas and to substantial and increasing population shifts from the countryside to the towns; (f) low levels of food consumption in most countries in both rural and urban areas, despite the steady growth of imports; (g) slow expansion of agricultural exports, and a progressive decline in the prices of the agricultural products chiefly exported by Latin America; (h) lack of integrated agricultural development planning, aiming at the removal of the existing obstacles and the solution of the above-mentioned problems through the adoption of continuing and consistent policies and appropriate administrative and institutional reforms.

The available statistical data substantiating this evaluation of trends in Latin American agriculture are summarized below. Later, in the second part of the present report, consideration will be given to

^{1/} See, for example, "Agriculture in Latin America: problems and prospects" (E/CN.12/686), March 1963; and Economic Survey of Latin America, 1966 (United Nations publication Sales No: E.68.II.G.I.), part four, "Agriculture in Latin America".

various alternative possibilities for agricultural development in the region, which may provide guidance in the adoption of future policies for this sector, with due regard to their repercussions on the development of other sectors of the economy.

1. Trends in production and yields

Although there are signs that over the past ten years the rate of expansion of agricultural production has been speeded up a little, estimates for the region as a whole place it at 3.4 per cent per annum between the two three-year periods 1949-51 and 1964-66, while the growth rate of the population was only slightly less (see table 1). The tempo of development was not, of course, the same in all countries. In some - Bolivia, Ecuador, Mexico and Nicaragua, for example - average annual production increments of more than 5 per cent were recorded, while in others - for instance, the Dominican Republic, Haiti and Uruguay - annual rates of increase fell short of 2 per cent. Only in eight of the nineteen countries included in table 1 did the growth rate of production significantly exceed that of the population (i.e., by 1 per cent or more). Elsewhere it was either lower, as in Chile, the Dominican Republic and Haiti, or just about the same.

The sluggish pace at which production indexes rose was considerably influenced by the slow rate of development of livestock production in most of the countries of the region. While crop production expanded at an annual rate of 3.8 per cent, the corresponding annual figure for livestock production was only 2.6 per cent, which implied a decrease in per capita production (see table 2).

Although different production trends were recorded for the major groups of products, the structure of production underwent no basic modification in the fifteen-year period considered (see table 3). The relative importance of cereals in total production slightly increased, in much the same proportion as that of meat declined; but the share of the other commodity groups remained largely unaltered.

/Table 1

Table 1

LATIN AMERICA: ANNUAL GROWTH RATES OF AGRICULTURAL PRODUCTION
AND OF POPULATION, BY COUNTRIES, 1950-65

Country	Production	Population
Argentina	2.2	1.8
Bolivia	5.3	2.1
Brazil	4.2	3.0
Chile	2.0	2.4
Colombia	3.0	2.9
Ecuador	7.5	2.8
Paraguay	2.8	2.8
Peru	3.2	2.6
Uruguay	1.5	1.4
Venezuela	5.5	3.8
Costa Rica	3.8	3.8
Dominican Republic	1.5	3.2
El Salvador	4.7	2.8
Guatemala	4.7	2.8
Haiti	0.1	2.1
Honduras	3.2	3.1
Mexico	6.4	3.3
Nicaragua	7.2	2.9
Panama	3.5	3.0
<u>Total</u>	<u>3.4</u>	<u>2.8</u>

Sources: For production, ECLA, on the basis of data supplied by the Food and Agriculture Organization of the United Nations (FAO). For population, Latin American Demographic Centre (CELADE).

Table 2

LATIN AMERICA: INDEXES OF CROP AND LIVESTOCK PRODUCTION, 1960 AND 1964-66
(1950=100)

	1960		Average for 1964-66			
			Indexes		Percentage growth rates	
	Total	Per capita	Total	Per capita	Total	Per capita
Crop production	147	112	175	115	3.8	0.9
Livestock production	129	98	146	96	2.6	-0.3
<u>Total</u>	<u>141</u>	<u>107</u>	<u>165</u>	<u>109</u>	<u>3.4</u>	<u>0.6</u>

Sources: ECLA, on the basis of production and population data supplied by FAO and CELADE, respectively.

/Table 3

Table 3

LATIN AMERICA: AGRICULTURAL PRODUCTION TRENDS, BY GROUPS OF PRODUCTS, 1949-51 AND 1964-66

Group	Percentage composition of production		Indexes and growth rates	
	1949-51	1964-66	Indexes (1949-51=100)	Growth rates (percentages)
Cereals	20.1	23.5	193	4.5
Roots and tubers	6.5	6.8	172	3.7
Vegetables	2.1	2.3	175	3.8
Oilseeds	3.6	3.5	161	3.2
Sugar and sugar products	10.8	10.3	156	3.0
Fruit	2.1	2.5	195	4.6
Beverages	10.2	9.0	144	2.5
Fibres	10.4	10.4	164	3.4
Wine	2.3	2.3	159	3.2
Other crops (tobacco, tomatoes, etc.)	1.7	1.9	189	4.4
Meat	16.4	13.5	136	2.1
Other livestock products (milk, eggs)	13.7	14.0	168	3.5
Total agricultural production	100.0	100.0	164	3.4
Total crop production	65.5	69.5	174	3.8
Total livestock production	34.5	30.5	145	2.6

Source: ECLA, on the basis of data supplies by FAO.

/These results

These results are partly imputable to the scanty technological progress made by the region in the period under review. With a few exceptions such as wheat in Mexico, maize in Chile and cotton in Mexico and Central America, most products showed little or no increase in unit yields. In table 4, which traces the evolution of yields of nine staple agricultural products between the two five-year periods 1948-52 and 1962-66, it can be seen that, apart from wheat and cotton, for which a significant improvement of more than 2 per cent per annum was recorded, in most of the other products changes for the better were minimal. In their case, such production increments as were achieved must be ascribed mainly to the expansion of the area under cultivation, and to that alone where rice is concerned.

The stagnation of productivity becomes even more striking if it is compared with the exceptional headway made in respect of agricultural yields in regions with more advanced agricultural sectors, such as Europe or North America (United States and Canada). While their maize crops steadily improved, at annual rates of over 4 per cent, only a modest yearly increment of 1 per cent was obtained in Latin America. In the case of barley the contrast was much greater still, since over against annual increase of 3.4 per cent in Europe and 2.2 per cent in North America, average yields in Latin America as a whole rose by barely one-fifth of one per cent per annum. Even the rate of expansion of cotton yields, which, as already pointed out, was notably stepped up in Latin America, was still far lower than in North America, where it reached 4.4 per cent yearly.

More thorough study of the situation in Latin America reveals marked differences in yields and in their rates of improvement from one country to another. For example, in Mexico wheat yields were almost trebled in the period under consideration, rising from 880 kilogrammes per hectare in 1948-52 to about 2,000 in 1962-66, whereas in some other countries - Brazil, Colombia and Peru, for example - they continued to stand at less than 1,000 kilogrammes per hectare. Much the same thing happened in the case of maize. In Chile yields were practically doubled,

Table 4

LATIN AMERICA: EVOLUTION OF PRODUCTION, AREA UNDER CULTIVATION, AND UNIT YIELDS,
BY SELECTED STAPLE CROPS, 1948-52 TO 1962-66

Crop	Indexes (1948-52=100)			Annual growth rates (percentages)		
	Produce- tion	Area	Yields	Produce- tion	Area	Yields
Wheat	148.4	108.8	137.1	2.9	0.6	2.3
Maize	189.9	165.3	114.8	4.7	3.7	1.0
Rice	200.8	201.3	99.4	5.1	5.1	-
Barley	111.9	110.1	101.9	0.8	0.7	0.2
Beans	177.6	173.4	101.8	4.2	4.0	0.2
Potatoes	163.3	129.0	126.6	3.6	1.9	1.7
Manioc	181.3	164.8	109.9	4.4	3.6	0.7
Cotton	209.3	144.4	142.9	5.4	2.7	2.6
Tobacco	174.7	148.0	119.0	4.1	2.8	1.3

Source: FAO, Production Yearbooks.

/increasing from

increasing from 1,400 kilogrammes per hectare to nearly 2,700;^{2/} in Brazil, Bolivia, Colombia and Paraguay, on the contrary, they remained fairly constant at levels below 1,300 kilogrammes per hectare. Similar situations are observable in respect of the other products, although of course the relations between the different countries vary.

A number of causes, in highly complex combinations, determine inter-country variations in productivity in absolute terms, and also differences in rates of increase of yields. Natural factors, such as climate, soil quality and water supply, inter alia, account for many of the absolute disparities, just as within each country the production capacity of different areas may vary widely. But a decisive influence on agricultural progress is also exerted by institutional factors (land tenure structures, credit facilities, organization and degree of efficiency of research, extension and educational services, etc.), available supplies and prices of physical inputs (fertilizers, pesticides, etc.), price policies for agricultural products, and so on. All these can be much more directly modified or manipulated by man than natural conditions. Cases in point are the new varieties of wheat in Mexico, and hybrid varieties of maize in Chile, whose development, adaptation and use entailed long years of research and dissemination of knowledge. They show what can be done by means of systematic effort on the part of the responsible agencies and of farmers themselves.

In livestock production too, both rates of herd increase and productivity indexes differ substantially from one country to another. Indexes of changes in inventories of cattle, sheep and pigs between 1948-52 and 1962-66, and the corresponding annual rates of increase, are presented in table 5. It will be seen that the cattle population - the main source of meat and milk - increased very slowly as a rule. With a few exceptions - Brazil, Honduras, Mexico, Panama and Paraguay, for example - most countries show only small annual increments of less than 2 per cent. In the case of sheep, development trends are even more unsatisfactory; decreases in several countries are not offset by the slight increases recorded elsewhere. Thus, sheep inventories virtually failed to expand in the region as a whole. In contrast, the number of pigs rose much faster in a good many countries, particularly Brazil, Mexico and Uruguay, where annual rates of increase exceeded 5 per cent.

^{2/} In 1967 they soared to about 4,000 kilogrammes per hectare.

Table 5

LATIN AMERICA: LIVESTOCK INVENTORY CHANGES, BY COUNTRIES, 1948-52 TO 1962-66

Country	Indexes (1948-52=100)			Annual growth rates (percentages)		
	Cattle	Sheep	Pigs	Cattle	Sheep	Pigs
Argentina	103.6	90.1	95.1	0.3	-0.7	-0.2
Bolivia	114.6	86.0	119.5	1.5	-1.0	1.3
Brazil	159.7	144.4	225.3	3.4	2.7	6.0
Chile	132.1	112.2	140.6	2.0	0.8	2.5
Colombia	102.9	104.4	96.6	0.2	0.3	-0.1
Ecuador	121.3	103.2	176.4	1.4	0.2	4.1
Paraguay	150.8	195.2	214.9	3.0	4.9	5.6
Peru	133.0	89.0	178.4	2.1	-0.8	4.2
Uruguay	108.9	95.5	163.5	0.6	-0.2	3.6
Venezuela	118.8	80.2	133.5	1.2	-1.6	2.1
Costa Rica	118.4	-	131.9	1.2	-	2.0
Dominican Republic	142.8	281.5	148.3	2.6	7.7	2.9
El Salvador	115.5	75.0	86.1	0.8	-2.1	-1.0
Guatemala	117.4	103.1	108.5	1.1	0.2	0.6
Haiti	136.6	125.5	130.8	2.3	1.6	1.9
Honduras	183.1	-	173.9	4.4	-	4.0
Mexico	213.3	118.8	197.5	5.6	1.2	5.0
Nicaragua	122.2	-	94.7	1.4	-	-0.3
Panama	159.1	-	95.5	3.4	-	-0.2
<u>Total</u>	<u>137.4</u>	<u>99.4</u>	<u>187.1</u>	<u>2.3</u>	<u>-0.1</u>	<u>4.6</u>

Source: FAO, Production Yearbooks.

The limited expansion of cattle and sheep inventories explains why per capita production of meat and other livestock products followed a downward trend in almost all the countries of the region. Some countries, however, made noteworthy efforts to encourage the development of poultry farming and fisheries, although as a rule they did not suffice to offset the relative decreases in the meat supply.

Despite the lack of data on degrees of efficiency and productivity in livestock activities in most of the Latin American countries, evidence has been found that for cattle the birth rate index (or percentage of births) ranges from 40 to 60 per cent, which is a very low level in comparison with the 85 per cent attained in the United States. Similarly, the low indexes of meat production per head of cattle or per animal slaughtered suggest that only a small proportion of the herds is earmarked for slaughter each year.

According to the data for selected Latin American countries given in table 6, the average carcase weight of beef cattle aged four years or over is less than 165 kilogrammes, i.e., a good deal lower than the 200 kilogrammes which is the usual figure in the United Kingdom and the United States for two-year-olds. Among the eleven countries included in the table, which are together responsible for over 90 per cent of beef production in Latin America, the only exceptions to the foregoing rule are Argentina and Uruguay, where the meat yield of animals slaughtered at a relatively early age ranges from 210 to 220 kilogrammes. Mention must be made, however, of Bolivia, Chile and Colombia, where average weights of over 200 kilogrammes were obtained, but in the case of fully-developed adult animals.

Although dairy farms in temperate zones, such as are found in Argentina, Chile and Uruguay, possess specialized breeds of dairy cattle and the necessary resources for proper pasture and herd management, and make intensive use of all the factors of production (land, capital and labour), the output of milk per cow/year - 1,000 to 1,500 litres - is several times less than in such countries as Canada, Denmark, the Netherlands and the United States. In most of Latin America's tropical zones, on the other hand, productivity is still lower - about 400 to 800 litres - because stock farming is carried on by extensive methods, and because of the difficulty of acclimatizing specialized herds imported from Europe.

Table 6

LATIN AMERICA: BEEF CATTLE YIELDS IN ELEVEN COUNTRIES

(Average 1958-66)

Country	Slaughtering rate	Meat per animal slaughtered (kilogrammes)	Meat per animal in the cattle population
Argentina	24.9	213	56
Bolivia	8.0	220	18
Brazil	9.8	190	18
Chile ^{a/}	15.0	245	37
Colombia	11.2	201	25
Ecuador	14.7	156	23
Mexico	10.2	183	18
Paraguay	13.4	189	24
Peru ^{b/}	12.3	111	14
Uruguay	16.4	220	36
Venezuela	11.5	175	21

Source: ECLA/FAO Joint Agriculture Division, on the basis of data supplied by FAO.

a/ Average for the period 1962-65, excluding yields from imported Argentine cattle.

b/ Excluding yields from imported cattle.

The comparison is equally unfavourable in the case of wool production. Average output is estimated at barely 1.5 kilogrammes per head of sheep, although in the countries of the southern cone of South America, unit yields on relatively large farms, where mixed grazing of sheep and cattle is the usual practice, reach from 3 to 4 kilogrammes of wool per head.

2. Foreign trade

The slow growth of external demand and the deterioration of agricultural prices on world community markets have powerfully militated against the more vigorous expansion of agricultural production in Latin America and the more rapid improvement of income in this sector. This is clear from the data presented in table 7, which shows changes in the indexes of the volume and value of agricultural exports between the five-year period 1948-52 and the three-year period 1965-67. The annual rate of increase of the volume of exports was 2.6 per cent, or less than the rate of population growth in Latin America. In other words, per capita exports can be seen to have decreased. In actual fact, however, the situation was much worse, since the price decline implied that the value of exports rose at the far slower annual rate of only 1.6 per cent. To put it in another way, in 1965-67 per capita foreign exchange earnings from agricultural exports amounted to about half the sum they had represented fifteen years before. In addition, carry-over stocks had piled up to an extent which in the case of coffee and sugar was positively alarming.

While per capita exports declined, imports expanded (see table 7). This reflects the inability of Latin American agriculture to meet the region's growing internal demand, although it must be recognized, in the first place, that some countries are not in a position to increase their production of every item consumed by the population, often on account of natural factors; and, secondly, that at least part of the additional imports represented exports from other countries within the region itself.

/Table 7

Table 7

LATIN AMERICA: INDEXES OF VOLUME AND VALUE OF FOREIGN TRADE IN AGRICULTURAL PRODUCTS

(1957-59=100)

	1948-52	1965-67	Annual rate of growth
<u>Exports</u>			
Index of volume	86.0	129.0	2.6
Index of value	97.0	124.7	1.6
<u>Imports</u>			
Index of volume	76.0	135.3	3.7
Index of value	89.0	133.7	2.6

Source: FAO, The State of Food and Agriculture, 1966 and 1968.

/In respect

In respect of certain products, the disparity between export and import trends altered the region's world trade position. For example, whereas before the Second World War Latin America had been a net exporter of wheat, by about 1.7 million tons per annum, in 1966 it was a net importer, by approximately 1.4 million tons. With the notable exception of sugar and cotton, Latin America's share of world trade in most agricultural exports contracted (see table 8). In the case of some crops - wheat and maize, for example - the setback was considerable.

With regard to the deterioration of export prices, table 9 sheds considerable light on trends recorded over the last fifty years for the main products traded on world markets. For several commodities, real price levels in 1965-67 were the lowest in the last half-century, comparable to those prevailing during the depression that preceded the Second World War. An outstanding case in point is the slump in sugar prices.

3. Income levels and social and institutional conditions in rural areas

The factors reviewed in the preceding sections combined to keep the agricultural gross product down to extremely low levels, with twofold results: Latin America's over-all rate of economic development was slowed up, and the agricultural sector's share in the total gross domestic product gradually dwindled, until by 1964-66 it was only 21.3 per cent.^{3/} On the other hand, huge as is the scale on which the rural population has migrated to urban areas during the last few decades, it still constitutes about half the total population. Hence the agricultural product in per capita terms was approximately one-fourth of the corresponding figure for the other sectors in the aggregate although it should be noted that the gap is narrowing, since fifteen years earlier the ratio was approximately 1:5.

^{3/} As against 24.5 per cent in 1950-52. At substantially higher income levels than those prevailing in Latin America, and in the framework of a much more dynamic economic development process, this trend would of course have a different significance.

Table 8

LATIN AMERICA: SHARE OF SELECTED AGRICULTURAL EXPORTS IN
WORLD TRADE, 1934-38 AND 1966

(Percentages of total world exports)

Export product	Average 1934-38	1966
Wheat and wheat flour (in terms of wheat equivalent)	22.5	9.4
Maize	71.7	21.4
Sugar (unrefined)	42.1	54.6
Bananas	82.3	76.6
Green coffee	85.4	64.4
Cocoa beans	30.1	18.9
Wool (real weight)	19.8	14.0
Cotton fibre	11.8	31.3

Source: FAO, The State of Food and Agriculture, 1966 and 1968.

/Table 9

Table 9

STAPLE AGRICULTURAL PRODUCTS: INDEXES OF FLUCTUATIONS IN AVERAGE
REAL PRICES ON THE WORLD MARKET

(1948-67 = 100)

Product (quality and market of origin)	1920/29	1930/38	1948/54	1955/59	1960/64	1965/67
Cotton (extra-long staple: Egypt)	115	76	135	98	82	86
Cotton (medium staple: United States)	120	93	130	96	88	76
Sheep's-wool (40.36's: Argentina)	...	93	113	100	97	73
Cocoa (beans: Ghana)	58	42	125	110	74	69
Coffee (Santos No 4: Brazil)	71	50	116	110	78	82
Coffee (Prime, washed: Guatemala)	...	56	113	116	78	80
Wheat (Northern Export class 2: Canada)	129	97	120	89	89	90
Hulled rice (white, whole: Thailand)	83	66	96	97	97	115
Maize (La Plata yellows: Argentina)	93	78	121	99	86	90
Groundnuts (hulled: Nigeria)	83	77	117	94	91	86
Linseed oil (in bulk: Argentina)	93	90	131	93	85	64
Palm oil (Nigeria)	109	82	115	95	88	91
Beef (frozen hindquarters: Argentina)	81	107	81	87	117	127
Mutton (frozen: New Zealand)	140	141	88	103	106	106
Sugar (raw, Cuban base) ^{a/}	155	76	119	95	114	45
Bananas (fresh: ^{b/})	163	150	108	103	92	92

Source: ECLA, on the basis of unofficial statistics supplied by the International Bank for Reconstruction and Development (IBRD).

a/ World market.

b/ Markets of origin: up to 1932, Jamaica, 1933-1938, Honduras; 1948-1961, Central America; 1961 onwards, Central America and Ecuador.

/But this

But this statement of the problem in terms of over-all averages, while sufficing to show that the situation of the agricultural population is one of serious hardship, veils to some extent the far worse tragedy of that vast majority of the rural population which is at the bottom of the scale of agricultural income distribution.

According to estimates based on ECLA's recent research into income distribution in several Latin American countries (see tables 10 and 11), the annual per capita income of about two-thirds of the agricultural population (i.e., some 70 million persons) averages less than 90 dollars, which implies an annual income per economically active person of approximately 275 dollars. This figure again is a general average which conceals the fact that a considerable number of rural families are living in utter penury, with a monthly per capita income of roughly 5 or 6 dollars.

Although most of this income is spent on food, it is so tiny that the diet of the typical Latin American peasant falls far short of minimum nutritional needs, with consequent damage to his health. Food surveys carried out in various Latin American countries provide reliable evidence of this fact.^{4/} The income left over for the purchase of other goods and services is consequently minute, and it is therefore not surprising that industrial development in the countries in question is encountering steadily increasing difficulties because of the small size of their domestic markets.

The causes of this situation are familiar enough. A great many studies carried out by ECLA, FAO and other United Nations and inter-American agencies have investigated the structural background of such problems, which has, moreover, been discussed at length.

Over-concentration of land ownership in a few hands, the survival of long-outdated land tenure systems, the slow progress of technology, the shortage and unsatisfactory distribution of credit, and the persistence of obsolete marketing methods are among the most important of the factors concerned.

^{4/} For fuller details, see Economic Survey of Latin American, 1966, op.cit., Part Four, table 286.

Table 10

LATIN AMERICA: DISTRIBUTION OF AGRICULTURAL INCOME BY DECILES OF ECONOMICALLY ACTIVE POPULATION
IN TEN COUNTRIES FOR WHICH DATA ARE AVAILABLE, 1965

Economically active population in agriculture		Agricultural income			Economically active population in agriculture		Agricultural income		
		Total		Per worker			Total		Per worker
Per-cent-age	Thousands of persons	Per-cent-age	Millions of dollars	(dollars)	Per-cent-age	Thousands of persons	Per-cent-age	Millions of dollars	(dollars)
A. Argentina					B. Brazil				
10.0	142	1.9	59.9	422	10.0	1 290	3.0	215.5	167
10.0	142	3.5	110.4	778	10.0	1 290	3.5	251.4	195
10.0	142	4.2	132.5	933	10.0	1 290	4.8	344.7	267
10.0	142	4.5	142.0	1 000	10.0	1 290	5.7	409.4	317
10.0	142	5.0	157.7	1 111	10.0	1 290	6.7	481.2	373
10.0	142	5.6	176.7	1 244	10.0	1 290	7.0	502.7	390
10.0	142	6.6	208.8	1 466	10.0	1 290	8.7	624.8	484
10.0	142	8.9	280.8	1 978	10.0	1 290	10.9	782.8	607
10.0	142	14.0	441.7	3 111	10.0	1 290	14.0	1 005.5	779
10.0	142	45.8	1 445.0	10 176	10.0	1 290	35.7	2 564.0	1 988
<u>Total</u>	<u>1 420</u>	<u>100.0</u>	<u>3 155.0</u>	<u>2 221</u>	<u>100.0</u>	<u>12 900</u>	<u>100.0</u>	<u>7 182.0</u>	<u>557</u>
C. Colombia					D. Costa Rica				
10.0	270	3.8	73.4	271.9	10.0	23.8	3.8	7.9	331.9
10.0	270	4.8	92.8	343.7	10.0	23.8	4.2	8.7	365.5
10.0	270	5.9	114.0	422.2	10.0	23.8	4.8	9.9	415.9
10.0	270	6.7	129.5	479.6	10.0	23.8	5.2	10.8	453.8
10.0	270	7.8	150.8	558.5	10.0	23.8	5.5	11.4	479.0
10.0	270	8.3	160.4	594.1	10.0	23.8	5.8	12.0	504.2
10.0	270	9.0	174.0	644.4	10.0	23.8	6.2	12.8	537.8
10.0	270	10.7	206.8	765.9	10.0	23.8	6.7	13.9	584.0
10.0	270	12.0	231.9	858.9	10.0	23.8	10.3	21.3	895.0
10.0	270	31.0	599.2	2 219.3	10.0	23.8	47.5	98.3	4 130.2
<u>Total</u>	<u>100.0</u>	<u>2 700</u>	<u>100.0</u>	<u>1 933.0</u>	<u>100.0</u>	<u>238.0</u>	<u>100.0</u>	<u>2 070.0</u>	<u>869.0</u>
E. Ecuador					F. El Salvador				
10.0	94	2.0	9.5	101.1	10.0	53	3.0	8.2	154.7
10.0	94	2.4	11.4	121.3	10.0	53	4.3	11.8	222.6
10.0	94	2.6	12.4	131.9	10.0	53	4.4	12.1	228.3
10.0	94	3.0	14.3	152.1	10.0	53	4.8	13.2	249.1
10.0	94	3.4	16.2	172.3	10.0	53	5.0	13.8	260.4
10.0	94	4.6	21.8	231.9	10.0	53	5.5	15.1	284.9
10.0	94	5.0	23.8	253.2	10.0	53	5.8	15.9	300.0
10.0	94	6.6	31.4	334.0	10.0	53	6.9	19.0	358.4
10.0	94	12.4	58.9	626.6	10.0	53	9.8	27.0	509.4
10.0	94	56.0	275.5	2 930.8	10.0	53	50.5	138.9	2 620.8
<u>Total</u>	<u>100.0</u>	<u>940</u>	<u>100.0</u>	<u>475.0</u>	<u>100.0</u>	<u>530</u>	<u>100.0</u>	<u>275.0</u>	<u>518.0</u>

/Table 10 (conclusion)

Table 10 (conclusion)

Table 10 (continued)

Economically active population in agriculture		Agricultural income			Economically active population in agriculture		Agricultural income											
		Total		Per worker (dollars)			Total		Per worker (dollars)									
Per-cent-age	Thousands of persons	Per-cent-age	Millions of dollars		Per-cent-age	Thousands of persons	Per-cent-age	Millions of dollars		Per-cent-age	Thousands of persons	Per-cent-age	Millions of dollars	Per-cent-age	Thousands of persons	Per-cent-age	Millions of dollars	Per-cent-age
G. Mexico																		
10.0	698	1.2	48.4	69.3	85.0	1 606.5	40.0	351.2	218.6									
10.0	698	2.8	113.0	161.9	10.0	189.0	15.0	131.7	696.8									
10.0	698	3.5	141.2	202.3	5.0	94.5	45.0	395.1	4 181.0									
10.0	698	4.4	177.5	254.3														
10.0	698	5.1	205.8	294.8														
10.0	698	6.1	246.1	352.6														
10.0	698	7.9	318.8	456.7														
10.0	698	10.0	403.5	578.1														
10.0	698	15.5	625.4	896.0														
10.0	698	43.5	1 755.2	2 514.6														
Total	100.0	6 980	100.0	4 035.0	578.0	100.0	1 890.0	100.0	878.0	465.0								
I. Uruguay																		
10.0	19	2.5	9.6	505.3	10.0	85	1.8	8.6	101.2	J. Venezuela								
10.0	19	2.5	9.6	505.3	10.0	85	3.0	14.5	170.6									
10.0	19	4.5	17.3	910.5	10.0	85	3.5	16.9	198.8									
10.0	19	6.0	23.1	1 215.8	10.0	85	4.0	19.3	227.1									
10.0	19	6.0	23.1	1 215.8	10.0	85	4.7	22.6	265.9									
10.0	19	7.0	27.0	1 421.0	10.0	85	6.0	28.9	340.0									
10.0	19	9.5	36.6	1 926.3	10.0	85	7.5	36.2	425.9									
10.0	19	14.0	53.9	2 836.8	10.0	85	10.0	48.2	567.0									
10.0	19	18.0	69.3	3 647.4	10.0	85	14.5	69.9	822.4									
10.0	19	30.0	115.5	6 078.9	10.0	85	69.9	216.9	2 551.8									
Total	100.0	190	100.0	385.0	2 026.0	100.0	850	100.0	482.0	567.0								

Source: ECLA estimates.

/Table 11

Table 11

LATIN AMERICA (TEN COUNTRIES): DISTRIBUTION OF AGRICULTURAL INCOME
BY GROUPS OF ECONOMICALLY ACTIVE POPULATION, 1965

Economically active population in agriculture			Agricultural income		
Country	Percentage	Thousands of persons	Total		Per worker (dollars)
			Percentage	Millions of dollars	
I. Subsistence group					
Argentina	10.0	142.0	1.9	59.9	421.8
Brazil	70.0	9 030.0	39.4	2 829.7	313.4
Colombia	40.0	1 080.0	21.2	409.8	379.4
Costa Rica	50.0	119.0	23.5	48.7	409.2
Ecuador	80.0	752.0	29.6	140.6	187.0
El Salvador	80.0	424.0	39.7	109.2	257.5
Mexico	70.0	4 886.0	31.0	1 250.9	256.0
Peru	85.0	1 606.5	40.0	351.2	218.6
Uruguay	20.0	38.0	5.0	19.3	507.9
Venezuela	70.0	595.0	30.5	147.0	247.1
<u>Total</u>	<u>65.2</u>	<u>18 672.5</u>	<u>28.2</u>	<u>5 366.3</u>	<u>287.4</u>
II. Intermediate group					
Argentina	89.0	1 263.8	79.6	2 511.4	1 987.2
Brazil	29.0	3 741.0	41.6	2 987.7	798.6
Colombia	57.4	1 549.8	63.5	1 227.5	792.0
Costa Rica	48.4	115.2	44.4	91.9	797.7
Ecuador	17.7	166.4	35.7	169.6	1 019.2
El Salvador	18.4	97.5	30.7	84.4	865.6
Mexico	27.0	1 884.6	49.5	1 997.3	1 059.8
Peru	13.0	245.7	30.0	263.4	1 072.0
Uruguay	76.7	145.7	81.3	313.0	2 148.2
Venezuela	28.1	238.8	56.9	274.3	1 148.7
<u>Total</u>	<u>33.0</u>	<u>9 448.5</u>	<u>52.2</u>	<u>9 920.5</u>	<u>1 050.0</u>
III. Upper group					
Argentina	1.0	14.2	18.5	583.7	41 105.6
Brazil	1.0	129.0	19.0	1 364.6	10 579.1
Colombia	2.6	70.2	15.3	295.7	4 212.2
Costa Rica	1.6	3.8	32.1	66.4	17 473.7
Ecuador	2.3	21.6	34.7	164.8	7 629.6
El Salvador	1.6	8.5	29.6	81.4	9 576.5
Mexico	3.0	209.4	19.5	786.8	3 757.4
Peru	2.0	37.8	30.0	263.4	6 968.3
Uruguay	3.3	6.3	13.7	52.7	8 365.1
Venezuela	1.9	16.2	12.6	60.7	3 746.9
<u>Total</u>	<u>1.8</u>	<u>517.0</u>	<u>19.6</u>	<u>3 720.2</u>	<u>7 195.7</u>

Source: Table 10.

/Fortunately, the

Fortunately, the need for radical changes in the systems in force is now clearly realized, and this awareness is responsible for the agrarian reform legislation which in recent years has been passed and put into effect in many Latin American countries. It would seem, however, that the imperative necessity of pushing on with the process at a higher speed and in greater depth has not yet been properly grasped. In many instances, priority has been given to the settlement of new land, or to the expansion of the area under irrigation, rather than to changing the existing land tenure patterns. Land settlement and irrigation are very valuable supplementary measures, and should unquestionably be promoted, but they cannot be regarded as a substitute for genuine agrarian reform.

The enlargement of the farming area, which has been taking place very quickly in Latin America, cannot be continued indefinitely at the same rapid rate as in the past, not only because it is a costly process - and the shortage of investment resources in the Latin American countries is all too well known - but also because in the last analysis the best way of raising the income of the broad masses of the rural population will be to increase productivity per worker. But if these masses are really to benefit by such an improvement in productivity, an indispensable requisite is that it should be directly linked to land distribution. According to the estimates presented in a later section of this study, the holders of minifundia would each need five times their present amount of land, which represents less than two hectares per worker, for their annual income per economically active person to reach about 740 dollars by 1985.^{5/} Similarly, several million agricultural workers would have to receive better wages.

Latin America possesses a wealth of highly diversified natural resources: every possible kind of soil and climate, vast grasslands and forests, a rich coastal belt. Moreover, the ratio between the size

^{5/} In these estimates Argentina is excluded, since it is so unlike the other countries of the region in the general picture it presents.

of the population of the region as a whole and the productive potential of its resources - given the introduction of appropriate techniques and systems for developing them - is much more favourable than in other parts of the world. Accordingly, it cannot but appear a startling paradox that so many millions of the region's inhabitants are poor and ill-fed; that so high a proportion of its resources is standing idle or is inefficiently developed; that notwithstanding their poverty and hunger, so many millions of its peasants are unemployed or under-employed; and, lastly, that it should have to spend over 600 million dollars on importing agricultural products from third countries, despite its economies' chronic shortage of foreign exchange.

In the following chapter, the basic objectives that should be pursued by an agricultural development policy are discussed; an attempt is made to measure - with all the reservations indicated - the possible scale of the resources available and the action to be taken, and to indicate the lines along which they should be directed; and a forecast is made of the probable impact of the changes on the other sectors of the economy.

Chapter II

BASIC ASPECTS OF AGRICULTURAL DEVELOPMENT POLICY IN LATIN AMERICA: AIMS AND IMPLICATIONS

The preceding chapter gave an idea of the results of the slow pace of agricultural development and the unequal distribution of agricultural production in the majority of Latin American countries; namely, wretched living conditions for most of the rural population, high levels of unemployment and under-employment, limited domestic markets for industrial development, an increase in imports and, in general, inadequate economic growth.

Clearly, the mere continuation of past trends and the repetition in the future of the existing inequalities and distortions in income distribution and the use of resources cannot be considered a satisfactory approach to agricultural development in the coming decades, not only because this would depress the economy of the region as a whole, but particularly because it would yield only minor improvements in the lot of the growing rural masses. If agricultural development in the large majority of Latin American countries continues at the same pattern and rate as in the past, the average annual per capita income of the rural population, which form the bulk of the largest population group - an income now standing at some 100 dollars - will rise by only 30 or 40 dollars over the next twenty years, while the average annual per capita income of the small group which owns most of the land and the means of production will rise to more than 1,000 dollars. Some thought should be given by the social consequences of this state of affairs, given that, if the vast natural resources of the region were distributed more evenly and exploited more rationally, and if an adequate amount of technical resources and capital were available, it would be possible for the rural population to enjoy substantially higher levels of nutrition and income than they do at present, and there would still be large exportable surpluses to supply less favoured regions.

/The present

The present chapter is designed to give a picture of what the aims and the structure of agricultural development in Latin America might be by about 1985, on the basis of certain assumptions regarding the gradual closing of the enormous gap between the poorer groups and the small fraction of the population with high incomes, against a background of accelerated development of the economy as a whole, and of the agricultural economy in particular. Most of all, it is designed to show the various agricultural development options open to the countries of the region, and to explore the behaviour of certain variables, and the effects of the various options on the over-all development of Latin America as a whole.

Owing to the inadequacy of the statistical data and the sheer size of the problem, it has been necessary to simplify and generalize the calculations and the conclusions to some degree, as regards both the geography of the region and the function of agriculture. Nevertheless, the main outline of the policy to be followed in respect of each of the alternatives is quite clear.

1. Domestic demand for agricultural products

In calculating the future pattern of domestic demand, which currently absorbs approximately three-fourths of the Latin American agricultural product, the main goal established is a substantial improvement in the consumption levels of the half of the population now at the lower end of the income scale which will require gradual changes in the distribution of income among the various population groups. The target considered here is that by 1985 this half of the population should have a level of per capita consumption equivalent to the present average for Latin America as a whole. In this connexion, it must be borne in mind that at present income distribution is extremely inequitable, with the result that the average per capita consumption of the lower income half of the population is equal to one-quarter of the average for the upper income half, and 40 per cent of the over-all average. Hence, the target can be attained if the average per capita consumption of the poorer half of the population grows at an annual rate of 4.7 per cent; in aggregate terms, the annual rate would actually have to be 7.8 per cent, given an annual rate of /population increase

population increase of 3 per cent. While such an increment may seem high in relative terms, especially compared with the slow rate of growth of the total income of Latin America hitherto, it is not really high in absolute terms. It would mean raising the per capita consumption level of the poorer group from 142 dollars ^{1/} in 1965 to some 356 dollars ^{1/} in 1985, i.e., a net increase of 214 dollars over the twenty-year period.

A comparison with the anticipated growth in the average consumption of the upper income group shows how moderate the projected increase really is. It is assumed that the consumption level of the latter group will grow in line with the over-all growth rate and in particular with the growth of investment. If the economy grows at an over-all annual rate of 6 per cent, the average per capita consumption level of the upper group will rise from 569 dollars in 1965 to 854 dollars in 1985, a net increment of 285 dollars, which is more than the increment for the lower group, but the rate of growth is very much lower.

If the economy grows at an annual rate of less than 6 per cent the rise in the per capita consumption level of the upper group will also be less. For example, if recent trends continue, and the total product grows at an annual rate of only 4.5 per cent, the increment would amount to only 26 dollars annually; conversely, the increment would be greater if the rate were higher than 6 per cent. Clearly, less effort is required to redistribute income and improve the income of the lower group as the over-all growth rate of the economy rises. Another model has been examined in an earlier ECLA study according to which the poorer 50 per cent of the population would double their total per capita consumption within seventeen years (4.2 per cent per annum) while the middle income strata (45 per cent of the population) would double theirs within 22 years. The consumption of the highest income group would initially fall and then rise slowly.^{2/}

^{1/} At 1960 prices (parity exchange rates).

^{2/} See Raúl Prebisch, Towards a dynamic development policy for Latin America (United Nations publication, Sales No.: 64.II.G.4).

Table 12 shows roughly the distribution of consumption for the upper and lower income groups in 1965, and the estimated distribution in 1985 on the basis of the assumptions described above. Total consumption has been divided into two categories: consumption of agricultural products and consumption of other goods, and services. Agricultural consumption amounts to some 30 per cent of the total consumption of the population as a whole; for the lower income group, however, this proportion is appreciably higher - approximately 40 per cent - while for the upper income group it is slightly less than 25 per cent. In order to forecast the figures for 1985, it was assumed - as mentioned above - that the consumption of the lower group would rise until it equalled the over-all average for 1965, namely 356 dollars, and that the ratio between agricultural and non-agricultural consumption would remain roughly the same. This would mean that this group's average annual per capita consumption of agricultural products would rise from 58 dollars to nearly 100 dollars, which would significantly raise its level of nutrition. However, the increase in its consumption of non-agricultural goods and services ^{3/} would be much greater, tripling over the same period. For the upper income group, whose total per capita consumption would increase by some 50 per cent by 1985, a rather low coefficient of elasticity of demand for agricultural products was used, an average of 0.2, because of this group's higher current level in absolute terms. Hence, the per capita agricultural consumption of the upper group would increase by slightly less than 10 per cent over the period, while its per capita consumption of non-agricultural goods and services would increase by almost 63 per cent.^{4/}

3/ Including marketing and processing costs for agricultural products. The figure for agricultural consumption is based on the farm prices of agricultural products.

4/ The difference between the rates of growth of the non-agricultural consumption of the two groups is of fundamental importance for the whole of economic development, since the structure of demand of the poorer group is radically different from that of the higher income group. Most of the estimated demand for non-agricultural goods from the lower half of the population, which is expected to amount to some 20 thousand million dollars' worth by about 1985, will probably be for mass consumption goods and services, which would be conducive to the creation of a larger number of job opportunities.

Table 12

LATIN AMERICA: CURRENT AND ESTIMATED CONSUMPTION OF GOODS AND SERVICES, BY POPULATION GROUPS, 1965 AND 1985

(Dollars at 1960 prices: parity exchange rates)

	Total population		Upper income 50 per cent		Lower income 50 per cent	
	Thousands of mil- lions of dollars	Dol- lars per capita	Thousands of mil- lions of dollars	Dol- lars per capita	Thousands of mil- lions of dollars	Dol- lars per capita
<u>1965</u>						
<u>Total consumption</u> a/	<u>80.0</u>	<u>356</u>	<u>64.0</u>	<u>569</u>	<u>16.0</u>	<u>142</u>
Agricultural consumption b/	21.6	96	15.1	134	6.5	58
Non-agricultural consumption	58.4	260	48.9	435	9.5	84
<u>1985</u>						
<u>Total consumption</u>	<u>245.7</u>	<u>605</u>	<u>173.4</u>	<u>854</u>	<u>72.3</u>	<u>356</u>
Agricultural consumption	49.0	121	29.5	145	19.5	96
Non-agricultural consumption	196.7	484	143.9	709	52.8	260

ANNUAL GROWTH RATES 1965-1985

(Percentages)

	Total population		Group A		Group B	
	Total	Per ca- pita	Total	Per ca- pita	Total	Per ca- pita
<u>Total consumption</u>	<u>5.8</u> c/	<u>2.7</u>	<u>5.1</u>	<u>2.0</u>	<u>7.8</u>	<u>4.7</u>
Agricultural consumption	4.2	1.2	3.4	0.4	5.6	2.6
Non-agricultural consumption	6.3	3.2	5.5	2.5	8.9	5.8

Source: Joint ECLA/FAO Agriculture Division.

a/ Equivalent to 81 per cent of the gross domestic product.

b/ Farm prices.

c/ The gross domestic product must grow at an annual rate of slightly over 6 per cent to meet this target for total consumption.

/For the

For the population as a whole, the estimated rate of growth of demand for agricultural products would then amount to 4.2 per cent, which is appreciably higher than the rates recorded hitherto. Clearly, this average rate masks substantial differences in the pattern of demand in the different countries and for different products. Table 13 illustrates these differences, and is based on the projections for South America of the FAO Indicative World Plan. Although these estimates do not take account of the accelerating effect that an income redistribution of the kind outlined here would have, they nevertheless give a useful picture of the disparities. The table shows, for example, that, while demand for selected products in Venezuela is expected to increase by two and a half to three times by 1985, the anticipated increase in demand for most of these products in Argentina and Uruguay should not be more than 50 or 60 per cent. There are three main reasons behind these disparities: differences in the rate of population growth, differences in current levels of per capita income and differences in per capita consumption levels for individual products.

It is interesting to note the effect on demand of a deliberate policy to improve income distribution or to speed up the growth rate. It is estimated in the indicative World Plan that between 1962 and 1985 domestic demand for foodstuffs in South America will grow at an average annual rate of 3.3 per cent; if significant changes are made in the pattern of income distribution, along the lines indicated in the present document, domestic demand for agricultural products in South America could grow at an annual rate of close to 3.8 per cent.^{5/}

^{5/} The difference between this figure and the 4.2 per cent rate for Latin America as a whole is due to the difference in the estimated rate of population increase (2.7 per cent for South America).

Table 13
LATIN AMERICA: PROJECTED DOMESTIC DEMAND FOR
SELECTED PRODUCTS, 1985

(1962 = 100)

Region and country	Rice	Wheat	Maize	Fruit	Meat	Veg- table oils	Milk and milk prod- ucts
<u>South America</u>	<u>211</u>	<u>180</u>	<u>191</u>	<u>220</u>	<u>204</u>	<u>224</u>	<u>216</u>
Argentina	151	133	141	184	141	167	150
Bolivia	209	217	197	210	258	250	231
Brazil	208	216	177	233	241	241	238
Chile	178	169	179	200	216	212	211
Colombia	237	244	211	237	244	249	244
Ecuador	239	245	233	231	270	275	255
Paraguay	207	205	192	203	198	220	211
Peru	233	232	202	232	299	260	307
Uruguay	132	123	...	141	127	135	130
Venezuela	300	256	244	289	302	300	275

Source: FAO, "Main conclusions and policy implications of the IWP regional study for South America" (LARC/68/4), paper presented at the tenth FAO Regional Conference for Latin America (Kingston, Jamaica, 2-14 December 1968).

/2. Net

2. Net external demand

As was seen in an earlier section of the present document, Latin America's agricultural exports and imports have evolved in a somewhat disparate fashion in recent years. While the volume of exports grew annually by 2.6 per cent between 1948-52 and 1965-67, and their value in real terms by only 1.6 per cent, the volume of imports grew annually by 3.7 per cent over the same period and their value in real terms by 2.6 per cent.^{6/}

These rates are for gross exports and imports, i.e., they cover both intra-regional and extra-regional trade. In order to project future net external demand it is necessary to separate these two elements, since, when looking at Latin America as a whole, the portion corresponding to intra-regional trade must be excluded because it really forms part of the internal demand examined in the preceding section. The growing importance of internal demand, however, will be considered at a later stage, when the problems of integration are discussed.

According to the data available, mainly taken from recent FAO studies,^{7/} the prospects for Latin American agricultural exports do not seem very encouraging, except for a few products, such as beef.^{8/} Whether it is because per capita consumption levels in the importing developed countries are already high and such countries have low rates of population growth; or because of the growing expansion of domestic agricultural production in the industrialized countries, both the importing and the exporting countries, under the umbrella of highly protectionist policies and subsidies; or because natural products are

^{6/} It should be noted that the decline in prices affected Latin America's agricultural exports more than those of the rest of the world (see table 7).

^{7/} FAO "Agricultural commodities - Projections for 1975 and 1985" (CCP 67/3 Rev.), August 1966; and "Main conclusions and policy implications of the IWP regional study for South America" (IARC/68/1), paper presented at the tenth FAO Regional Conference for Latin America (Kingston, Jamaica, 2-14 December 1968).

^{8/} Forestry and fisheries products for which prospects are good also are not included in these figures.

feeling the effects of industrial technological progress and are gradually being supplanted by synthetics or a smaller proportion of finished goods - the fact is that the principal Latin American exports to the rest of the world are bound to expand at a relatively slow pace unless very profound changes occur in international trade relations.

It is not easy to estimate future trends for Latin American agricultural exports with any precision. On the basis of the studies referred to above, however, it is estimated that extra-regional exports, which make up approximately one-quarter of the total value of the Latin American agricultural product, will probably increase at an average annual rate of 2.6 per cent over the period 1965-85. Total gross exports, on the other hand are expected to increase by approximately 2.8 per cent annually, as a result of greater relative growth in intra-regional trade, which should constitute 17 per cent of total exports in 1985, as compared to 12 per cent in 1965.

Table 14 gives a summary of the projected growth of exports of the main agricultural products. For such products as cotton, coffee and cocoa, the prospects are frankly discouraging, while they are somewhat less so for such tropical products as bananas and sugar, although no marked increase in per capita exports is anticipated. Only with meat and cereals is a sustained demand expected, although recent estimates made by the Organization for Economic Co-operation and Development (OECD) suggest that the market for feed grains may decline severely during the seventies.

The combined exports of this large group of products (86 per cent of total agricultural exports in 1965) are expected to grow at an annual rate of 2.6 per cent between 1962 and 1985. The remaining agricultural exports, comprising a large number of products of lesser individual importance, will probably increase at a slightly higher rate and by 1985 should represent 17 per cent of the total. This would mean that the over-all annual rate of increase of gross agricultural exports would rise to 2.8 per cent.

Table 14

LATIN AMERICA: PROJECTED AGRICULTURAL EXPORTS, 1985

Products	Millions of dollars at 1962 prices		Annual rate (per- cent- ages)
	1962	1985	
<u>Crops</u>			
Cereals	322	1 000	5.0
Coffee and cocoa	1 434	2 154	1.8
Sugar	875	1 445	3.2
Cotton	531	639	0.8
Bananas	225	545	3.9
Other	520 ^{a/}	1 190	3.7
Sub-total	<u>3 907</u>	<u>6 973</u>	<u>2.6</u>
<u>Livestock</u>			
Meat (total)	421	1 167	4.5
Other	100 ^{b/}	233	3.8
Sub-total	<u>521</u>	<u>1 400</u>	<u>4.4</u>
Total gross exports	<u>4 428</u>	<u>8 373</u>	<u>2.8</u>
Intra-regional exports	<u>530</u> ^{c/}	<u>1 425</u>	<u>4.4</u>
Crops	420	1 120	4.4
Livestock	110	305	4.5
Extra-regional exports	<u>3 898</u>	<u>6 948</u>	<u>2.6</u>
Crops	3 487	5 853	2.3
Livestock	411	1 095	4.3

Source: Joint ECLA/FAO Agriculture Division, on the basis of: FAO, "Main conclusions and policy implications of the IWP regional study for South America" (LARC/68/4); FAO, "Agricultural commodities - Projections for 1975 and 1985" (GCP 67/3 Rev.), August 1966; ILPES/SIECA, "Base para una estrategia de desarrollo centroamericano", preliminary study September 1966; and "Proyecciones de la oferta y la demanda de productos agropecuarios en México para 1970 y 1975" (September 1965), published jointly by the Ministry of Agriculture, the Ministry of Finance and Public Credit, and the Banco of México.

- ^{a/} Estimated at approximately 13 per cent of total crop exports.
^{b/} Estimated at approximately 20 per cent of total livestock exports.
^{c/} Estimated at approximately 12 per cent of total gross exports.

/In 1962,

In 1962, extra-regional Latin American exports constituted 88 per cent of total agricultural exports, the remaining 12 per cent being attributable to intra-regional trade. As was observed above, it is expected that intra-regional trade will grow at a faster pace than over-all external trade in agricultural products and will eventually absorb a higher proportion of external trade. It has been estimated that increased trade in wheat, meat, sugar, fruit, fibres, tobacco and many other products may raise the total from approximately 530 million dollars in 1962 to slightly over 1,400 million dollars in 1985, at an annual rate of increase of 4.4 per cent. Clearly, this figure might be even higher as integration proceeds and becomes more effective. Suffice it to recall, in this connexion, the extraordinary upswing in agricultural exports within the Central American Common Market during the few years it has been in operation. Hence, total extra-regional exports should grow from 3,900 million dollars to 7,000 million between 1962 and 1985, an annual rate of increase of 2.6 per cent. This is the rate used in the calculations below to determine the increment required in agricultural production.

It is estimated that extra-regional imports, which in 1965 totalled close to 600 million dollars, could largely be replaced by Latin American products, since there are sufficient natural resources within the region, and thus the share of imports in total domestic consumption might fall sharply over the next fifteen or twenty years. Accordingly, it has been assumed that the absolute total of extra-regional imports will be no higher than in 1965, which would mean that the share of such imports in total consumption of agricultural products would be more than halved. On the other hand, as was pointed out above, there may be a marked increase in intra-regional trade in these products, since obviously not all countries will be in a position to raise their current level of self-sufficiency. On the contrary, the progress made in economic integration, whether at the regional or the subregional level, will necessarily help to bring national production plans into line with each other and will promote specialization, which should certainly result in increased trade flows. Nevertheless, it will be necessary to surmount

/many obstacles

many obstacles for this increase in intra-regional trade in agricultural products to reach the levels anticipated without slowing down national efforts to promote agricultural development. This topic is discussed further in a subsequent section.

3. Production

Table 15 was prepared on the basis of the projections of domestic demand mentioned above and of extra-regional exports and imports, and shows the indexes that total Latin American agricultural production will have to reach to be in line with the projections. The figures show that the volume of production will have to increase at an annual rate of 3.9 per cent during the period 1965-85. Clearly, this rate does not represent any dramatic increase over past performance, since the annual increase in per capita production would still be less than 1 per cent, although, as will be seen below, achieving this rate will in any case require the Latin American countries to make extraordinary efforts. Be that as it may, it is easy to see from the table that the factor depressing the growth of production is the slow expansion of exports. If exports, instead of growing at an annual rate of 2.6 per cent, could grow at a rate of 4 per cent, for instance, production would rise at an annual rate of 4.2 per cent.^{9/}

Obviously, the rate of 3.9 per cent is an average for the region as a whole and thus masks the big differences between individual countries which have different growth rates for domestic demand and different external trade prospects for their agricultural products. In order to simplify this analysis of the various development options, however, it was thought preferable to use the average regional figures as a point of departure, although as far as possible a number of important national variations or trends have been included.

^{9/} These figures do not, however, take account of the status of stocks which, in the case of sugar and coffee, for instance, are quite large. A policy to reduce stocks gradually might lead to a slightly lower growth rate for production.

Table 15

LATIN AMERICA: PROJECTED VOLUME OF AGRICULTURAL PRODUCTION, 1985

	Production	Exports	Imports	Domestic consumption							
<u>A. Percentage distribution of the value of production in 1965</u>											
<u>Agriculture</u>	<u>100</u>	<u>25</u>	<u>3</u>	<u>78</u>							
Crops	60	20	2	42							
Livestock	40	5	1	36							
<u>B. Projections for 1985</u>											
	Domestic consumption		Export		Imports		Production				
	Annual rate (percent-age)	Index	Relative value a/	Annual rate (percent-age)	Index	Relative value a/	Index	Relative value b/	Index	Annual rate (percent-age)	
<u>Agriculture</u>	<u>4.2</u>	<u>228</u>	<u>178</u>	<u>2.6</u>	<u>167</u>	<u>42</u>	<u>100</u>	<u>3</u>	<u>217</u>	<u>217</u>	<u>3.9</u>
Crops	3.9	215	90	2.3	157	31	100	2	119	198	3.5
Livestock	4.6	246	88	4.3	232	11	100	1	98	245	4.6

Source: Joint ECLA/FAO Agriculture Division.

a/ Calculated by applying the respective index of growth to the values for 1965.

b/ Equivalent to the value of domestic consumption plus exports, less imports.

c/ Calculated on the basis of 1965 production values.

An attempt has been made to break down the over-all figures for agricultural production into figures for crops and for livestock since these two sectors have to be dealt with separately in the analysis that follows of productivity and the expansion of land under cultivation. Table 15 shows that livestock production is expected to grow substantially faster than crop production. The reasons for this can be found in the anticipated pattern of both domestic demand and exports of crops and livestock. The current consumption levels of a number of crop products, such as cereals, sugar, roots and tubers, are fairly high in many Latin American countries, and it does not look as if they will rise to any great extent even taking the optimistic view that incomes will rise and be redistributed. Increased demand for such products as oil, fruit and vegetables, which have a relatively high income-elasticity, will be counterbalanced by the slow growth in demand for the products mentioned above, which have considerable weight in over-all consumption. For crop products as a whole, a coefficient of elasticity of 0.33 has been used, comprises a higher coefficient for the lower strata and a much lower coefficient for the upper strata.

The coefficient of elasticity used for livestock products was 0.6, reflecting the tendency of the population to consume a larger quantity of protective foods, such as meat, milk and eggs, as its income climbs. Moreover, as noted in an earlier section, nutritional deficiencies in most Latin American countries are greatest with respect to precisely these products. With the exception of Argentina and Uruguay, and to a lesser extent Paraguay, the countries of the region have very low consumption levels for livestock products. It is reasonable to expect, therefore, that raising the real income of the broad masses of the population, together with the establishment of a more suitable nutritional policy, will lead to a sharp rise in demand for livestock products. Moreover, as observed above, external demand is also expected to rise at a more sustained rate for meat than for most crop products.

In view of the above, the difference between the annual production growth rates for the two sectors - 3.5 per cent for crop production and 4.6 per cent for livestock - would seem justified. These projections mean that domestic consumption in 1985 would be much more balanced than at present, the two types of products having a virtually equal share.

/It is

It is now time to take a look at these hypotheses of production growth in terms of both increased agricultural productivity and expanded productive area. As is well known, these two factors of production are complementary and vary in inverse proportion to one another. For example, the more rapid the rise in productivity per hectare the less need there is to expand the area of land under cultivation, and vice versa.

4. Crop productivity and production area

As was seen in chapter I, crop yields per hectare have risen at a slow pace in the past. For a large group of products, the average annual increment in unit yields was barely 0.8 per cent between 1948-52 and 1962-66, although it was appreciably higher for certain products, such as wheat and potatoes, and in certain countries, Mexico for example. If this trend were to continue in the future, it would mean that to achieve an average annual growth rate of 3.5 per cent for crop production the area under cultivation would have to be increased by 2.7 per cent annually, or by 70 per cent over a twenty-year period. In absolute terms, this would mean adding an area of almost 60 million hectares.

Although in many Latin American countries land resources are not in short supply, and there are still abundant reserves, it is quite clear that the best land is already being cultivated, although perhaps not so efficiently as it might be. Pushing forward the agricultural frontier is a costly process because of the large amount of investment required in infrastructure to make land suitable for cultivation; moreover, no precise data exist on the productive potential of these land reserves, most of which are in the virtually virgin territory of the Amazon basin. Therefore, it would not appear advisable to rely in the main on expanding the area under cultivation in order to increase production, particularly since the advances in agricultural technology in recent decades should make it possible to raise unit yields considerably if suitable production methods and techniques are used. The present analysis is therefore based on the assumption that average crop yields output will rise at an annual rate of 1.7 per cent over the next twenty years, which would mean doubling the amount of technological improvement made hitherto. The area of land under cultivation would then increase at a much more modest annual rate of only 1.8 per cent, which in absolute terms would mean a net increase of some 35 million hectares by 1985.

/This assumption

This assumption is supported by the experience of various parts of the world, including, of course, the Latin American countries. The cases of wheat in Mexico, cotton in Central America and maize in Chile are tangible evidence that thanks to the introduction of new varieties, more intensive use of fertilizers and pesticides and the expansion of irrigated areas, to name but a few factors, a spectacular increase in yields can be achieved. The experience of these countries is particularly striking since the increases were in average national yields, which cover a large number of farmers and a wide range of situations, and not in yields obtained on experimental farms.

New varieties of cereals not only give better yields, they are also highly adaptable in ecological terms, which means that they can be cultivated in large areas hitherto producing only native low-yield varieties. For example, the use of hybrid maize in Chile raised yields to as much as fifteen tons per hectare on many commercial farms, and raised the national average yield from 1,400 to over 3,300 kilogrammes per hectare between 1950 and 1967. Mexican dwarf wheat varieties, which enabled Mexico to raise its average yield from 900 to over 2,400 kilogrammes per hectare between 1950 and 1967, are already being successfully grown in such countries as India and Pakistan. In Pakistan, where 1.2 million hectares were sown with the new varieties, yields of three tons per hectare were obtained, more than double the yield of traditional varieties, and yields of seven tons per hectare were obtained on irrigated land, but this was under experimental conditions.

A great many other innovations, which have already proved their worth in various countries, could also help to raise crop yields. A great deal of experience has been acquired in the use of fertilizers ^{10/} and pesticides, the application of rational methods of soil preparation, sowing and harvesting, rotation of crops, water use, etc., on the basis of which it can be affirmed categorically that Latin America can achieve much higher levels of productivity than its present ones.

^{10/} For more details see El uso de fertilizantes en América Latina (United Nations publication, Sales No: 67.II.G.3).

What is needed is the formulation and application in all countries, of a deliberate policy of technological improvement, including, inter alia, strengthening the research and extension services, intensive training of specialized staff at both the university and the secondary levels, increasing the production of inputs and lowering their prices, the use of new crop varieties on a larger scale, increasing the area under irrigation and making better use of water, crop disease and pest control, etc. Clearly, yields will not increase at the same rate for all products. While for wheat and maize an average annual rise of some 2.2 per cent may be expected, the figure for beans is not likely to be more than 1 per cent. With perennial crops such as coffee and cocoa, yields could be substantially increased by replacing old unproductive plantations with new plantations, and by introducing new methods on existing plantations.

Similarly, there will certainly be large differences in the rate of technological improvement between individual countries. In this connexion it should be noted that Brazil, which accounts for such a large proportion of the total population of the region, will have to make a very special effort since for the past fifteen years its indexes have been rising at a very slow pace.

5. Livestock productivity and production area

As indicated above, the output of the livestock sector will have to rise at the rate of 4.6 per cent annually if it is to meet the forecasts of domestic and external demand. This is a good deal higher than its former rate of 2.6 per cent, and its achievement would mark a turning-point in the patterns of agricultural development that have prevailed up to now in Latin America.

The livestock population and unit yield can be substantially increased by among other things, combating diseases and pests, improving the volume and quality of the fodder available and, in general, by adopting more scientific methods of management, and by building stables, silos, watering-places and so on. Although the region as a whole has

/had little

had little success in this respect, as is shown in the very sluggish pace of development in nearly every country, there have been numerous cases in which the adoption of these measures has brought about a spectacular advance in livestock output. The characteristics of the livestock sector, and of cattle in particular, do, of course, preclude very rapid progress, and there is every likelihood that even if an intensive programme of technological improvement and herd management were put into effect immediately, it would not begin to yield results until a few years had gone by. However, the span of twenty years contemplated in this study affords enough time for a livestock development policy based on the application of a wide range of measures of the kind suggested above to yield the looked-for results.

The analysis that follows is focused on the possibilities of developing the cattle population, which, although the mainstay of the livestock sector, is making the slowest progress in most countries. There is no real reason why pig and poultry production should not increase more rapidly than in the past or than at the rates postulated in the hypothesis under discussion. Sheep production, however, is not expected to develop very much, and the general considerations applicable to the cattle herds are equally valid in this case.

Whether or not the cattle population can be increased in 1965-85 largely depends on the extent to which the birth rate can be stepped up, mortality reduced and the rate of extraction kept within "normal" limits.^{11/}

The birth rate varies according to the number of dams fit for reproduction, their fertility, the availability of stud bulls and the existence of an artificial insemination service, health conditions, the type of feeding and the care taken of the breeding stock. The proportion of cows suitable for reproduction is usually higher on intensive dairy

^{11/} The "normal" slaughtering rate is the past rate recorded for production of beef cattle for slaughter during a period of prosperity in the cattle-breeding industry or a cattle boom.

farms and farms concerned solely with stock-breeding. Where there is mixed stock farming, as is usual in Latin America, the average is about 45 per cent, although in Argentina and Uruguay it is nearly 54 per cent. The percentage of calves born in relation to the number of dams suitable for reproduction ranges from an average of 50 per cent in most of the Latin American countries to a little over 60 per cent in those with a more modern livestock industry, namely Argentina and Uruguay.^{12/} It is thought that it would be feasible to raise these coefficients somewhat and, by 1985, to achieve a regional average of 50 per cent for the proportion of dams fit for reproduction and of 60 per cent for natality, provided that appropriate methods of technical improvement are introduced on a large enough scale.^{13/}

It is considered that the mortality rate, which now averages 7 per cent, could be reduced to not more than 5 per cent by the end of twenty years through systematic control of cattle diseases and pests, particularly on farms where diseases that lower production, such as foot-and-mouth, brucellosis and parasitic infestations, are commonly found and where there is a high death rate for milking calves owing to colibacillosis, salmonellosis or paratyphosis,^{14/} pneumonia, pyobacillosis, diphtheria and coccidiosis, which could be largely eradicated through normal practices of veterinary prophylaxis.

As regards extraction, it is calculated that the rate of slaughter for beef cattle could be raised from the present regional average of 14 per cent to 20 per cent by 1985 by keeping back an adequate proportion of dams and speeding up the process of fattening heifers. In countries where cows that are not particularly fertile or suitable for breeding purposes are eliminated and bullocks are prepared for slaughter at an early age, the rate of extraction is fairly high, being over 20 per cent;^{15/}

^{12/} This rate can be as high as 80 to 90 per cent in more developed countries.

^{13/} The number of live births could be raised by 20 per cent or more through the systematic vaccination of cattle with a heavy incidence of infectious abortions.

^{14/} With its clinical symptoms of pneumo-enteritis, it can kill off as many as half the calves under three months old.

^{15/} About 24 per cent in Argentina.

where, on the other hand, cows are left for too long before they are killed and bullocks are four to five years old before they go to the slaughter-house, the extraction rate is relatively low (10 to 15 per cent). This applies to the majority of Latin American countries. Hence, there is no reason why a long-term increase in the rate of slaughter should not be combined with a consistent increase in the stock of cattle. Proof of this is to be found in all countries of the region. In central Brazil, for instance, in the Huastecas area of Mexico, on Colombia's Atlantic seaboard and the coastal plains of other countries, the genetic improvement of zebu cattle and cross-breeding with specialized beef cattle have made it possible for many stock-farmers to lop at least two years off the age at which bullocks are slaughtered.

The combined effect of all these factors will gradually increase the cattle population, at a rate rising from 2.8 per cent yearly in 1965 to 4.4 per cent towards 1985, and an average of 3.5 per cent a year for the period as a whole. Output of beef would then climb by 5.6 per cent each year and milk output by 4.8 per cent. These increases would be more than enough to meet the needs of the development model under consideration, and have been specified chiefly in order to show that there would be no particular technical difficulty in achieving a rate of 4.6 per cent, which is the target for the livestock sector as a whole.^{16/} In fact it would probably be enough if the stock of cattle were to expand by about 3.2 per cent each year. On the assumption that this will be so, an assessment has been made of the supply of fodder needed to prevent the expansion programme from falling short of its targets of underfeeding of the herds.

Latin America now has 535 million hectares of pastureland, of which about 65 million is artificial or has been improved. The remainder consists of natural grazing whose characteristics and yield differ so

^{16/} Production of pork and poultry meat, which together represented about 12 per cent of the total value of livestock output in 1965, could easily be increased to an annual rate of more than 6 per cent. The previous calculations made no allowance for a possible improvement of meat and milk yield per head, since more than twenty years would have to pass before yield could be appreciably changed. Some progress may, however, be made as a result of the over-all improvement of the herds.

widely that it is difficult to gauge its carrying capacity.^{17/} In order to make it easier to calculate future grazing requirements, natural pastureland has been converted into its equivalent in terms of artificial pasture at a ratio of 3 to 1, which roughly reflects the average situation in the region at the present time. Actual pastureland, expressed in those terms, is thus about 222 million hectares (65 million in real terms and 157 million in equivalent terms).

It has been estimated that the supply of fodder should increase at least 2.8 per cent yearly to meet the requirements of the cattle population, which is expected to expand by 3.2 per cent annually, and of the stock of sheep and horses. The last two species together account for a little under 40 per cent of the bovine stock in terms of homogeneous animal units, but their share of the total will shrink as they are expected to increase more slowly in the future.^{18/}

The need for additional fodder could be satisfied by enlarging the grazing area and raising the productivity of the existing pastureland through a number of technical improvements, such as the use of fertilizers, rotation of pastures, proper cutting and a system of silage for tiding the animals over difficult periods. As the pastureland covers a much wider area than arable land, it is doubtful whether its yield can be improved at the same rate (1.7 per cent). It has therefore been assumed that it could be raised by about 1.3 per cent annually, which would mean an increase of about 30 per cent in average yield after twenty years. The net expansion in area would thus have to be 1.5 per cent yearly; in absolute terms this involves enlarging the area from 222 million hectares to 300 million hectares in terms of equivalent land by 1985.

There are various ways of arriving at this goal. If, for instance, the current proportions of artificial and natural grazing land (29 and 71 per cent respectively) are maintained, it would be necessary to add

^{17/} Including land lying fallow which represents about 10 per cent.

^{18/} The sheep population will probably increase at a rate of not more than 2 per cent annually, and the horse population will either remain constant or decrease in absolute terms as a result of mechanization.

nearly 190 million hectares to the agricultural area. If, on the other hand, it is decided not to expand the area, 182 million hectares of natural grassland would have to be transformed into artificial pastures (since each hectare of artificial grazing is equal to three hectares of natural pastureland). Table 16 presents several possible combinations of the two for meeting the over-all requirements for a larger grazing area. The first possibility is the maintenance of the same proportions between the two kinds in 1985 as in 1965, and the addition of round 190 million hectares to the total livestock area. The second is based on the extrapolation of the past trend of growth for artificial pastureland.^{19/} If artificial pastureland is formed at the same rate as in the past, by 1985 there would be a total of about 130 million hectares of artificial grazing available, i.e., twice as much as in 1965. However, although high, this rate is apparently inadequate, because it would still be necessary to enlarge the aggregate livestock area by a little over 100 million hectares. This, combined with the expansion in crop land, would add up to a total net expansion of round 140 million hectares in the agricultural area. The third possibility would be to transform enough natural grazing land to provide 100 million hectares of artificial pastureland between 1965 and 1985. Although the efforts entailed would be greater than in the past, only 35 million hectares of additional land would be needed. The fourth alternative envisages the maintenance of the present gross total of 535 million hectares, with an all-out drive to transform natural grassland into artificial grazing.

^{19/} Although the statistics on formation of artificial pastureland are fragmentary, it can be established that, between 1950 and 1960, this type of land increased at the rate of 3.4 per cent yearly in a group of six countries.

Table 16

**LATIN AMERICA: ALTERNATIVE PROJECTIONS FOR THE
EXPANSION OF THE LIVESTOCK AREA, TO 1985**
(Millions of hectares)

	1965	1985			
		Ia/	IIb/	III	IV
Artificial pastureland	65	88	130	165	182
Natural pastureland	470	636	510	405	354
<u>Total</u>	<u>535</u>	<u>724</u>	<u>640</u>	<u>570</u>	<u>536</u>
Total in terms of equivalent pastureland c/	222	300	300	300	300

Source: Joint ECLA/FAO Agriculture Division, on the basis of national censuses.

- a/ Projection of the past trend for the ratio between artificial pastureland and the total grazing area.
- b/ Projection of the past trend for transforming natural grazing into artificial pastureland.
- c/ Three hectares of natural pastureland are equivalent on an average to one hectare of artificial pastureland.

As the first two possibilities have serious drawbacks in that they involve a big expansion of the agricultural area, and the fourth solution is unrealistic because a drive into the interland to open up new areas for grazing will take place in any case, the third alternative has been chosen as the most likely to achieve the goals set for the increase of the fodder supply. This would entail increasing the artificial pastureland from 65 to 165 million hectares, while reducing the natural grasslands and fallow land from 470 to 405 million hectares.

If the next expansion in the livestock area is added to the new land to be provided for crop farming, the total net figure for the expansion of agricultural land by 1985 would be 70 million hectares. This represents approximately 12 per cent of the over-all area in 1965.

6. Gross agricultural product and its distribution

Now that the levels which should be attained by agricultural production and the various methods of attaining them have been established, attention must be focused on agricultural income and its distribution among the various social groups, within the model under consideration.

Since technical improvements in crop farming and stock farming will require a considerable increase in expenditure on physical inputs (fertilizers, improved seeds, pesticides, feed, spare parts for machinery, etc.), gross agricultural income will probably grow at a somewhat slower rate than that previously estimated for the gross value of production, which, as will be recalled, would be 3.9 per cent annually in the period 1965-85. The studies of South America carried out under the FAO Indicative World Plan show that the cost of inputs currently amounts to approximately 17 per cent of the total gross value of agricultural production, and this proportion is expected to rise to 24 per cent in 1985, assuming that the prices of inputs remain the same. There are, however, strong possibilities of appreciably reducing the unit cost of many of these inputs, both because of an improvement and a better control of the systems for marketing them - which operate on the basis of huge profit margins and have serious deficiencies - and because of a decrease in manufacturing costs inside and outside the region as a result of the accelerated progress being made in industrial technology and the economies of scale likely to occur with the expansion of demand.^{20/} Taking these possibilities into account, it was estimated that the same volume of inputs, at lower prices than at present, might well represent only 21 per cent of the gross value of agricultural production in 1985 instead of 24 per cent, as indicated above. This percentage was

^{20/} A case in point is the decline in recent years in the unit price of nitrogen on the world market, a trend which is likely to continue in the future. Moreover, studies carried out recently on the use of fertilizers, pesticides and agricultural machinery in some countries of the region have shown that the sale prices of these inputs could be reduced by 20 to 30 per cent with the introduction of some basic changes in the marketing systems.

taken to be valid for the whole of Latin America, and not only for South America, since there was not enough information to make the necessary adjustments to include the remaining countries. In view of the weight carried by South America within the whole region, however, it seems unlikely that this coefficient would alter much.

Allowing for the greater expenditure on inputs, the rate of growth of gross agricultural income during the period 1965-85 would drop to 3.7 per cent annually.^{21/} This hypothesis, however, does not contemplate any change whatsoever in the price ratios between agriculture and the rest of the economy, except that which was considered feasible in relation to inputs. Nevertheless, the real income of farmers could be increased in two ways: (1) by raising the real prices of agricultural commodities, or (2) by reducing the marketing costs of agricultural commodities and transferring the difference to the agricultural sector. For the purpose of this analysis, the second of the two alternatives has been chosen as being the more viable, since the increase in agricultural prices would be a heavy burden on low-income urban consumers and might result in a decline in demand for some agricultural commodities, which would partly cancel out the favourable effect on agriculture of the change in relative prices. Moreover, unless the present patterns of agricultural income distribution change radically - a question which is analysed in detail below - the transfer of income from the urban groups to the rural sector (largely the economically weaker population strata) would mainly benefit the major agricultural operators, who control the bulk of production and

^{21/} Calculated as follows:

(a) Gross value of production,	1965 : 100;	1985 : 216
(b) Cost of inputs,	1965 : 17;	1985 : 45
(c) Gross agricultural product,	1965 : 83;	1985 : 171
(d) Indexes,	1965 : 100;	1985 : 206
(e) Annual growth rate 1965-85	3.7 per cent.	

/whose personal

whose personal incomes are fairly high already. It would thus be a socially unjust and regressive policy. Of course, this is a fundamental issue which must be examined within the context of agrarian reform and of an over-all development policy vis-à-vis specific situations.

In contrast, the second alternative would enable the agricultural sector to benefit from the productivity increases in the intermediate sector, inasmuch as consumers would continue to pay the same prices. It is reasonable to assume that a process of rationalizing and improving agriculture would also extend to the marketing and processing of agricultural commodities, which now account for about one-third of the final price paid by the consumer. If the intermediate sector's share could be kept down to 28 per cent of the final price (as a general average), agriculture could increase its own share from 66 to 72 per cent by the end of the period, thereby improving its real income by approximately 10 per cent, and the growth rate of gross agricultural income would then be 4.3 per cent annually, instead of 3.7 per cent as determined previously.^{22/ 23/}

^{22/} Calculated as follows:

- | | | |
|---------------------------------------|------------------------|-----|
| (a) Gross agricultural product, | 1965 : 83; 1985 : 171 | |
| (see footnote 21); | | |
| (b) 10 per cent improvement in gross, | | |
| value of production; | | 22 |
| (c) Improved gross agricultural | | |
| product; | | 193 |
| (d) Indexes; | 1965 : 100; 1985 : 232 | |
| (e) Annual rate | 4.3 per cent | |

^{23/} Clearly this approach, though valid for the agricultural sector as a whole, is not equally valid for the different groups or sub-sectors of agricultural production. For certain products the marketing margins could hardly be reduced to the percentage indicated above because their prices are controlled and the margins therefore already minimal. In the case of other products, however, the intermediate sector has a much larger share, which leaves room for a greater reduction. In any event, this is a relatively little known question which, because of its importance, should be studied in depth in all the Latin American countries and in relation to the largest possible number of agricultural commodities.

/It will

It will now be seen how the objectives of increasing per capita income and consumption in the poorest segment of the agricultural population can be attained in terms of the two possibilities of growth calculated for gross agricultural income, and of the global model examined at the beginning of this section.

Since the agricultural population of Latin America represents a high proportion of the region's total population, it is obvious that, if the model is to be consistent, the lowest income group in the rural sector - which lives at a subsistence level - will also have to raise its per capita consumption by 4.7 per cent annually, i.e., the same rate as that taken as the objective for the lower income population in general. For this sector gradually to increase its saving and capital formation capacity, its per capita income must grow faster than its consumption; the rate assumed for purposes of this analysis is 5.1 per cent annually over the period considered.^{24/}

On the basis of the information available on agricultural income distribution in an important group of Latin American countries, it is estimated that about two-thirds of the agricultural population in the region would fall into the subsistence group, and it is for this sector that an increase of 5.1 per cent annually in per capita income is envisaged.

That proportion, however, together with the absolute levels of per capita income, varies from country to country. While in Argentina, for example, only 10 per cent of the agricultural population belongs to the subsistence category proper, in Ecuador, El Salvador and Peru the proportion is 80 per cent or more (see table 11). Further, the average income per economically active person in this group ranges from an annual 400 dollars or more in Argentina, Costa Rica and Uruguay to less than 200 dollars in Ecuador.

^{24/} It is estimated that the rate of saving in agriculture will have to increase considerably in the future in order to meet the sector's increased investment needs.

/Despite these

Despite these disparities, which reflect different levels of agricultural development and of population concentration, extreme inequality in the distribution of agricultural income is fairly widespread in the region. A comparison of the situation of the top and bottom income deciles of the population reveals the following contrasts: the bottom decile absorbs less than 2 per cent of gross agricultural income in Argentina, Mexico and Venezuela, 2 to 3 per cent in Brazil, Ecuador, El Salvador and Uruguay, and over 3 per cent but less than 4 per cent in Colombia and Costa Rica. On the other hand, the top decile absorbs over 40 per cent of gross agricultural income in six of the nine countries for which detailed information is available, and 30 to 40 per cent in the three remaining countries.

These contrasts are even more striking when they are examined in monetary terms, and income ratios are established between the various strata. In all countries of the region except Argentina and Uruguay, where the annual income of the bottom decile is over 400 dollars per economically active person, the income of the population in this decile is incredibly low. In Mexico, for example, it is approximately 70 dollars annually, and in Ecuador and Venezuela about 100. It must be remembered that this income is calculated per economically active person, so that per capita income would be no higher than one-third of the above figures.

On the other hand, the top decile received annual incomes which ranged from 2,000 dollars per economically active person in Brazil to over 10,000 dollars in Argentina. An even sharper contrast is revealed however, if only the landowning élite (from 1 to 3 per cent of the agricultural population) is considered within the top decile. As shown in table 11, this group received an income per active person of over 40,000 dollars in Argentina, 10,000 to 20,000 dollars in Brazil and Costa Rica, and over 5,000 dollars in Ecuador, Peru, El Salvador and Uruguay.

It is easy to see that Argentina follows a very different pattern from the other countries studied, both as regards absolute per capita incomes, which are higher in Argentina, and the disparities between the

/top and

top and the bottom income groups. Similarly, as indicated above, the proportion that may be considered as really belonging to the subsistence group in Argentina is very much smaller than in the rest of the region (except Uruguay). For these reasons, and in order to avoid presenting a picture that might appear to be distorted by the inclusion of Argentina - which carries so much weight in the region's agricultural output - it was thought best to exclude this country from the following estimates and analysis. This does not mean that there are no serious structural problems in Argentina's agriculture ^{25/} requiring urgent solution; but the nature and size of the problems are different, so different measures and policies will be required to correct them. ^{26/}

Table 17 shows the large groups into which the population of Latin America (excluding Argentina) has been divided according to levels of income. The subsistence group is composed of all the low-income agricultural population, i.e., holders of minifundia and unskilled workers, and their families and dependants. Altogether they represented about two-thirds of the total agricultural population in 1965 and received about 28 per cent of gross agricultural income, the average annual income being 273 dollars per economically active person or 88 dollars per head.

The intermediate group comprises owners and operators of medium-sized and family-type farms, and skilled employees and workers, with their families and dependants. In 1965 this group represented about 30 per cent of the total agricultural population and absorbed a little less than half the gross agricultural income, with annual income averaging 874 dollars per economically active person or 282 dollars per head.

^{25/} See the study undertaken by the Inter-American Committee for Agricultural Development (CIDA).

^{26/} As Argentina is excluded, it has been necessary to adjust the estimates of the variables used hitherto for Latin America as a whole. Thus, under hypothesis I (constant prices), the growth rate of the gross agricultural product would be 3.9 per cent, instead of 3.7, and under hypothesis II (improved prices), it would be 4.5 instead of 4.3 per cent.

Table 17

LATIN AMERICA (EXCLUDING ARGENTINA): DISTRIBUTION OF
AGRICULTURAL INCOME, 1965

Group	Agricultural population ^{a/}			Agricultural income				
	Per cent-ages	Economically active total		Total		Per capita		
		(millions)		Per cent-ages	Millions of dollars ^{b/}	Economically active total	(dollars) ^{b/}	Index
Subsistence ^{c/}	67.7	21.5	66.8	32.8	5 874	273	88	100
Intermediate ^{d/}	30.5	9.7	30.1	47.4	8 474	874	282	320
Upper ^{e/}	1.8	0.6	1.8	19.8	3 541	6 063	1 967	2 221
<u>Total</u>	<u>100.0</u>	<u>31.8</u>	<u>98.6</u>	<u>100.0</u>	<u>17 889</u>	<u>563</u>	<u>131</u>	<u>206</u>

Source: Joint ECLA/FAO Agriculture Division, on the basis of research by CIDA and ECLA.

- ^{a/} The same relationship between total agricultural population and economically active agricultural population is assumed for the different income brackets.
- ^{b/} At 1960 prices.
- ^{c/} Includes holders of minifundia and agricultural wage-earners (with or without the right to work the land) and their families and dependants and excludes employees and skilled workers.
- ^{d/} Includes operators of family-type and medium-sized multi-family farms (employing less than twelve wage-earners), employees and skilled workers, and their families and dependants.
- ^{e/} Includes operators of large multi-family farms and their families and dependants.

/Lastly, the

Lastly, the upper group is composed of owners and operators of large farms, with their families and dependants. Altogether they represented 1.8 per cent of the agricultural population and received nearly 20 per cent of agricultural income in 1965. On an average, their income was over 6,000 dollars annually per active person, or nearly 2,000 dollars per head, which is twenty-two times more than the subsistence group. As will be seen later, the pattern of distribution was even more regressive with respect to the ownership of farm land.

If the estimated growth rates ^{27/} are applied to the figures for gross agricultural income in Latin America (excluding Argentina) in 1965 (17,889 million dollars), the total gross income of the sector in 1985 would be 38,443 million dollars if prices remain constant, or 43,148 million dollars if prices improve. The income of the subsistence group would rise from 88 to some 240 dollars per head or from 273 to 738 dollars per active person, in line with the above assumption. In these circumstances, the per capita income of the subsistence sector in 1985 would still be below the present figure for the intermediate sector (282 dollars), although it would be a third higher than the average per capita income of the whole agricultural sector in 1965, which was only about 180 dollars.

The proportion of total income which the subsistence group will have to receive if the above objective of improving per capita income is to be achieved will vary under either of the two hypotheses considered according to the population growth in this group. Therefore, the first step must be to determine the likely growth rate of the agricultural population, which in turn will depend on the rate of urbanization attained.

During the period 1950-65 the urban population growth rate for the whole of Latin America (excluding Argentina) was as high as 5 per cent

^{27/} The annual growth rate for agricultural income in the region, excluding Argentina, is expected to average 3.9 per cent if prices remain constant, and 4.5 per cent if prices increase.

annually, while the rural population increased by only 1.5 per cent annually.^{28/} The factors underlying the large-scale population shifts from the country to the towns are sufficiently well known and need no further comment. It is, moreover, a perfectly normal movement in developing economies, which appears to be accentuated, as in the majority of the Latin American countries, when the proportion of rural population is very high and productive employment opportunities in agriculture are scarce. If urbanization continued in the future with the same intensity as in the past, the agricultural population would continue to increase but at lower and lower rates until it reached its peak in 1977; it would then begin to decline in absolute terms so that in 1985 it would have reached the same figure as that recorded in 1965. If the rate of urbanization dropped to 4.5 per cent, however, the increase in the rural population would be 1 per cent annually, and if the rate dropped even further - to 4.2 per cent annually - the agricultural population would increase at the same rate as in the past, i.e., 1.5 per cent.

As noted above, a small variation in the growth rate of the urban population gives rise to significant changes in the rate of increase in the agricultural population, and these changes are accentuated as the proportion of agricultural population shrinks. This in turn has a decisive influence on the distribution of agricultural income, particularly when efforts are being made to raise the income of part of the population to a certain level.

In view of the difficulty of making an accurate forecast of the rate of urbanization in the next few decades, it has been decided to analyse the question of agricultural income distribution in the region on the basis of five alternative rates of rural population growth, (alternative A-E), ranging from an annual average of zero per cent (which means that the past rate of urban growth would be maintained) to 2 per cent

^{28/} If Argentina is included, the urban population growth rate for the region would be lower - 4.6 per cent annually - but the rate for the rural sector would still be 1.5 per cent.

annually (see table 18). This last rate, which is much higher than that recorded in the past and which would result from a drastic reduction in the rate of urbanization - a highly unlikely eventuality - is presented with the purpose of determining what would happen if a deliberate policy were adopted to retain more manpower in the rural areas.

Table 18 shows the effect of the five alternative possibilities of growth of the active rural population on the distribution of income among the three groups into which the rural population has been divided, taking into account the following premises: (i) the target for the subsistence group in 1985 is 738 dollars annually per active person, according to the assumptions indicated previously;^{29/} and (ii) the growth rate of total gross income in the intermediate group would be 3.2 per cent annually (under hypothesis I, constant prices) or 4.2 per cent annually (under hypothesis II, improved prices). These percentages relate to the average annual income of the intermediate and upper groups taken together, according to alternative A (the growth rate of the active rural population being zero). In alternatives B, C, and D only the total income attained by the intermediate group is considered, excluding that of the upper group (see comments below). The income of the upper group was obtained residually, on the assumption that its numbers would remain unchanged whichever alternative was considered.^{30/}

^{29/} Although they would no longer be in the subsistence category upon attaining these income levels, this term will continue to be used for the members of this group purely for purposes of identification.

^{30/} Since the upper group would have to support the whole burden of income redistribution under the four alternatives involving an increase in rural population, it was considered more realistic to assume that this group would not increase in numbers during the period 1965-85 and might even become smaller.

Table 18

LATIN AMERICA (EXCLUDING ARGENTINA): PROJECTED DISTRIBUTION OF AGRICULTURAL INCOME, 1985

Hypothetical alternative rates of growth of the economically active popu- lation & (percentages)	Subsistence group			Intermediate group			Upper group			Total						
	Total income		Income per economically active person	Total income		Income per economically active person	Total income		Income per economically active person	Total income		Income per economically active person				
	Per- cent- ages	Millions of dollars		Per- cent- ages	Millions of dollars		Per- cent- ages	Millions of dollars		Per- cent- ages	Millions of dollars					
	Annual rate (per- cent- ages)	Dollars (per- cent- ages)	Annual rate (per- cent- ages)	Dollars (per- cent- ages)	Annual rate (per- cent- ages)	Dollars (per- cent- ages)	Annual rate (per- cent- ages)	Dollars (per- cent- ages)	Annual rate (per- cent- ages)	Dollars (per- cent- ages)	Annual rate (per- cent- ages)					
Hypothesis I: Growth rate of the gross agricultural product is 3.9 per cent annually																
A : 0.0	41.3	15 880	738	5.1	41.4	15 916	1 641	3.2	17.3	6 647	11 382	3.2	100.0	38 443	1 209	3.9
B : 0.5	45.6	17 548	738	5.1	41.4	15 916	1 435	2.7	13.0	4 979	8 526	1.7	100.0	38 443	1 094	3.4
C : 1.0	50.4	19 374	738	5.1	41.4	15 916	1 345	2.2	8.2	3 153	5 598	neg	100.0	38 443	991	2.9
D : 1.5	55.6	21 390	738	5.1	41.4	15 916	1 218	1.7	3.0	1 197	1 947	neg	100.0	38 443	897	2.4
E : 2.0	61.4	23 598	738	5.1	38.6	14 845	1 030	0.8	-	-	-	neg	100.0	38 443	814	1.9
Hypothesis II: Growth rate of the gross agricultural product is 4.5 per cent annually																
A : 0.0	36.8	15 880	738	5.1	44.6	19 233	1 983	4.2	18.6	8 035	13 759	4.2	100.0	43 148	1 360	4.5
B : 0.5	40.7	17 548	738	5.1	44.6	19 233	1 795	3.7	14.7	6 367	10 302	2.9	100.0	43 148	1 228	4.0
C : 1.0	44.9	19 374	738	5.1	44.6	19 233	1 625	3.1	10.5	4 541	7 776	1.2	100.0	43 148	1 112	3.5
D : 1.5	49.6	21 390	738	5.1	44.6	19 233	1 472	2.6	5.8	2 525	4 324	neg	100.0	43 148	1 007	2.9
E : 2.0	54.7	23 598	738	5.1	44.6	19 233	1 394	2.1	-	-	-	-	100.0	43 148	913	2.4

Source: Joint ECLA/FAO Agriculture Division.

a/ In the subsistence and intermediate groups.

b/ The economically active population in the upper group is constant.

It is fairly obvious that as the rural population growth rate increases, the subsistence group will have to receive a higher proportion of total income if its members are to reach the per capita income levels proposed. If the agricultural population in 1985 remained the same as in 1965 (alternative A) and prices remained constant (hypothesis I), the subsistence group would increase its share of gross agricultural income to 41.3 per cent (compared with 32.8 per cent in 1965), while the share of the intermediate group would drop to 41.4 per cent (47.4 per cent in 1965) and that of the upper group to 17.3 per cent (19.8 per cent in 1965). If the gross agricultural product increased and the rural population did not, however, the upper group could raise both its aggregate and per capita income by 3.2 per cent annually, or the same rate as for the intermediate group. In absolute terms, this alternative would mean that the average income per active person in the upper group could rise from about 6,000 dollars in 1965 to over 11,000 dollars in 1985. Although the ratio of income per active person in the upper group to that in the subsistence group would be lower than at present, dropping from 22 to 1 in 1965 to 15 to 1, in absolute terms, the gap between the two groups would be much wider. The net increase in the subsistence group would be about 465 dollars annually per active person, compared with 5,300 dollars in the upper group. In other words, the inequality in distribution would be virtually the same. Therefore, there are grounds for assuming that, if this possibility of population growth materializes, more could be done to improve the per capita income of the subsistence population or to freeze funds for investment. This would be even more evident in the case of hypothesis II, which assumes a 10 per cent improvement in the prices received by farmers. If the same target is maintained for the subsistence group, the absolute disparity between it and the upper group, in terms of income per active person, would be still further accentuated. Compared with the modest increment in the subsistence group - 465 dollars annually - according to alternative A, the income per active person in the upper group would increase by about 7,600 dollars annually. A somewhat similar situation arises if the positions of the intermediate and upper groups are compared. The difference in income per active person would increase

/from approximately

from approximately 5,200 dollars in 1965 to 9,700 dollars in 1985. It may be concluded, therefore, that a more equitable distribution policy under this alternative would result in a somewhat rapid growth of per capita income in the intermediate group than that shown in table 18, while in the upper group the increase would be slower. In other words, this possibility of growth would raise the income of most of the rural population to a much higher level than that contemplated, without greatly affecting the present income levels of the upper group.

The situation changes radically when, instead of the rural population remaining the same, the alternative possibilities of growth are considered, particularly if the rate is 1 per cent or more annually. In that case, per capita income in the upper group would not only fail to increase but would decline to a point where it would disappear altogether as the rural population growth rose to 2 per cent annually.^{31/} It will be noted from table 18 that, according to this last possibility of population growth, it would no longer be enough to use the whole income of the upper group which would therefore, disappear as such; in order to attain the proposed targets it would be necessary to distribute a small proportion of the income received by the intermediate group also. Nevertheless, this would not represent a reduction in its per capita income in absolute terms compared with 1965, but merely a slower increase than that contemplated in the other alternatives, and a considerable decrease in the ratio between the two groups.^{32/}

These estimates are presented with a view to illustrating the possible implications of deliberate policies to improve rural income distribution. Obviously the achievement of certain objectives will depend

^{31/} Under hypothesis II the situation improves slightly for the upper group, with a tapering off of the rate of decrease in per capita income in relation to the population growth in the other two groups.

^{32/} While in 1965 the ratio of income per active person in the intermediate group to that in the subsistence group was 3.2 to 1, in 1985, under alternative E it would be approximately 1.4 to 1. The difference would also be much smaller in absolute figures: about 300 dollars in 1985 as against 600 dollars in 1965.

on specific conditions and on the feasibility of the reforms and measures introduced in particular situations. Thus, for example, if the rural population increased at the high rate of 2 per cent, in all probability the increase in income in the subsistence group would be smaller than that envisaged. The larger the proportion of income retained by the owners of latifundia the greater would be the difference between the target and the actual figures for this group. If, for instance, it was supposed that the upper group should retain at least 10 per cent of the total gross agricultural income if its members were to maintain at least the same level of income per active person as they received in 1965, this would mean - if the population growth is 2 per cent - that the target for the subsistence group would drop from 738 dollars to only 620 dollars. On the other hand if the rural population increased by 1 per cent annually, the aggregate income of the upper group would have to decline slightly in absolute terms in order to maintain the target for the subsistence group and raise the income of the intermediate group. This trend is accentuated, as indicated above, if the agricultural population grows more rapidly, and is attenuated if the relative agricultural prices improve (hypothesis II).

It may be asked how the double process of increasing the aggregate agricultural product and distributing income so as to benefit the subsistence group can be carried out. The only answer is through a far-reaching agrarian reform and modernization of agricultural activities, which would involve changes in the present systems of land tenure, a more equitable distribution of rights to the use of land an improvement in real wages, more intensive research, the dissemination of its results to all farmers, and an increase in investment.

It is difficult to achieve these social and economic objectives without changing the present structure of land ownership, land tenure, and farming. Although the group labelled "subsistence group" owns a certain amount of land, it may be considered to consist almost entirely of wage-earners (both employed and unemployed). The holder of minifundia, who have a very small area of land per family generally located in highly unsuitable places (steep slopes with poor soil, usually affected by erosion),

/obtain a

obtain a large part of their income by working on large commercial farms. It is common knowledge, moreover, that the unemployment and under-employment levels in Latin American agriculture are very high, although naturally they differ from country to country. Reasonable estimates, put open unemployment at approximately 10 million persons of working age.^{33/} This huge idle manpower potential clearly exerts pressure on rural wages and, therefore, it seems unlikely that real wages can match the postulates in the present study unless there is large-scale absorption of the unemployed labour force. Undoubtedly, the most direct way of absorbing it is by giving land (or the right to work it) to the landless rural population which has no opportunity of obtaining employment as agricultural workers or employees.

In the circumstances, it might be argued that the best policy would be to intensify land settlement and to give the redundant population the new farm land that is gradually brought under cultivation. It is estimated that over 60 million hectares will have to be opened up for crop farming and stock farming in the region (excluding Argentina) up to 1985 if the proposed production targets are to be attained. Perhaps some 5 million economically active persons could be settled in this area,^{34/} which is below the present unemployment figure. Only if there were no population growth at all in the rural areas could this solution be considered even partially satisfactory. If the rural population increases, however, it is absolutely imperative that, in addition, part of the land of the latifundia - which is generally farmed at a very low level of productivity or is not

^{33/} In studies carried out by the Latin American Demographic Centre (CELADE) and the Latin American Institute for Economic and Social Planning (ILPES) (document Inst/S.3/L.3, "Elementos para la elaboración de una política de desarrollo con integración en América Latina") total visible unemployment and under-employment (the latter expressed in terms of open unemployment) are estimated at not less than one-third of the economically active population in Latin America's agricultural sector.

^{34/} It must be remembered that in order to produce the same income, more land per head must generally be assigned in new agricultural areas than in established farming areas. It is roughly estimated that it should average about 12 hectares, or 8 to 9 hectares in terms of equivalent area.

fully utilized - should be transferred to the subsistence group. As will be seen below, the faster the rural population grows, the greater the amount of land that has to be transferred.

If, on the other hand, it was planned to absorb all the present and future unemployed, by distributing only the new land brought under cultivation, the average area per active person would not be enough to guarantee the per capita income levels postulated above. Obviously, the idea is not to create a larger number of minifundia holders, who in any case would continue to exert pressure on the labour market, but to establish producers linked to the market, who would be able to apply up-to-date production methods and obtain the incomes they need to maintain reasonably high levels of living by farming their land themselves.

By distributing the latifundia among workers owing little or no land, under systems of ownership or farming which are analysed in another part of this study, fuller advantage would be taken of two important and currently idle resources: land and manpower. In addition, better use would be made of capital, since it is less costly to increase the productivity of land already under cultivation - much of which possesses some kind of infrastructure - than to open up virgin areas.

Viewed from a technical angle, the change in the existing systems of land tenure and ownership is justified also. Experience indicates that the traditional owners of latifundia are reluctant to accept technical innovations, even though they usually have the financial backing of credit organizations and reasonable access to sources of technical information. With some exceptions, the owner of a large estate, with its huge area of land and plentiful supply of cheap labour, prefers to take the line of least resistance and maintain the traditional production patterns, which require less capital (i.e., less risk), limited entrepreneurial capacity (the farm can be left in the hands of an overseer) and virtually unskilled manpower. The resulting low unit productivity is easily compensated for by the number of hectares or head of cattle which the owners of the

.../latifundia have

latifundia have at their disposal. It is clear, therefore, that a direct way of breaking the vicious circle of technical stagnation is to transfer the land rights to a larger number of persons, who would have to raise the unit productivity in order to obtain the income they want. This would undoubtedly entail substantial investment in technical assistance and credit for the many rural workers benefiting from agrarian reform. An effort of this kind would have to be made in any case, however, to attain the faster rate of increase in productivity per hectare referred to above, whatever the system of land tenure and ownership. If the present system were to remain unchanged and if by some means the opposition to technical innovations on the part of the traditional owners of latifundia could be overcome, there is no doubt that agricultural yields - and therefore production - would improve. It is not so certain, however, that the agricultural workers would benefit to the same extent. On the contrary, it is likely that in the face of policy decisions concerning substantial increases in real wages, the large farmers would be tempted to increase mechanization and dismiss large numbers of wage-earners, thus increasing unemployment and, therefore, the poverty of many rural families which are unable to find work in other activities.

With a view to establishing some orders of magnitude concerning the likely implications of agrarian reform in terms of the distribution of land, an attempt will now be made to link the estimates of income distribution that have been formulated with others relating to the amount of farm land that would have to be distributed to obtain that income. Needless to say, these are very rough estimates, because of the scanty basic information available and because they relate to the region as a whole. The idea is merely to provide criteria which may be useful in clarifying the problems and possibilities involved.

Table 19 shows how the farmland of Latin America (excluding Argentina) was divided among the different groups belonging to the agricultural sector in 1965. The upper group, for instance, with 1.9 per cent of the active population, held more than 50 per cent of the total area (about 45 per cent of the area expressed in equivalent terms), with an area per active person of over 400 hectares or nearly 180 hectares of equivalent. At the other end of the scale, the minifundia holders, who represent more than 20 per cent of the active population, have only 2.4 per cent of the total agricultural area (or 4 per cent in equivalent terms) and average less than 2 hectares per person.^{35/} The intermediate group, although in a much more favourable position than the minifundia holders are still a good way below the upper group, which holds fifteen to twenty times as much land per active person.

Tables 20 and 21 show the end results of distributing the agricultural area in Latin America (excluding Argentina), which by 1985 will amount to 322 million equivalent hectares, among the different groups concerned. Allowance has been made for the changes that will take place in income distribution between 1965 and 1985, as postulated in the model. For instance, the upper group, which in 1965 had 20 per cent of the income and 45 per cent of the land, and, according to alternative C, would have only 8 per cent of the income in 1985, would have their land reduced proportionately, that is, they would have no more than 19 per cent of the total equivalent area in 1985. The change for the intermediate group would follow the same principle. Under the hypothesis of improved prices, the proportions owned by the intermediate and upper groups would be slightly larger. It is assumed that the anticipated improvement in productivity would be equal in all groups, but this would probably not be so in practice. However, this inevitable generalization is not overwhelmingly important for the calculations made here. The differences in the average technological improvement achieved in each group would have to be very pronounced to affect the changes in land distribution to any real extent.

^{35/} It should be remembered that a further 46 per cent of the active population consist of landless workers at the subsistence level.

Table 19

LATIN AMERICA (EXCLUDING ARGENTINA): DISTRIBUTION OF AGRICULTURAL LAND ^{a/}
BY GROUPS OF ECONOMICALLY ACTIVE POPULATION, 1965

Group	Economically ac- tive population		Total area			Equivalent area ^{b/}		
	Per- cent- age	Mil- lions of per- sons	Total	Per eco- nomically active person	Total	Per eco- nomically active person		
			Per- cent- age	Mil- lions of hectares	Per- cent- age	Mil- lions of hectares	Per- cent- age	Mil- lions of hectares
<u>Own-account workers</u>	<u>51.3</u>	<u>16.3</u>	<u>100.0</u>	<u>448.3</u>	<u>27.5</u>	<u>100.0</u>	<u>228.8</u>	<u>14.0</u>
Minifundia holders	21.4	6.8	2.4	10.9	1.6	4.1	9.4	1.4
Intermediate group	28.0	8.9	45.2	202.5	22.8	50.5	115.5	13.0
Upper group	1.9	0.6	52.4	234.9	402.2	45.4	103.9	177.9
<u>Landless wage-earners</u>	<u>48.7</u>	<u>15.5</u>	"	"	"	"	"	"
Unskilled	46.2	14.7	"	"	"	"	"	"
Skilled workers and employees	2.5	0.8	"	"	"	"	"	"
<u>Total</u>	<u>100.0</u>	<u>31.8</u>	<u>100.0</u>	<u>448.3</u>	<u>14.1</u>	<u>100.0</u>	<u>228.8</u>	<u>7.2</u>

Source: Joint ECLA/FAO Agriculture Division.

a/ Excluding forest areas and wasteland.

b/ Natural pastureland has been expressed in terms of artificial pastureland at the rate of 3:1.

c/ Including economically active dependants.

/Table 20

Table 20

LATIN AMERICA (EXCLUDING ARGENTINA): RELATION BETWEEN INCOME DISTRIBUTION AND THE EQUIVALENT AGRICULTURAL AREA, BY INCOME GROUPS, 1965 AND 1985

(Percentages)

Income group	1965		1985									
	Income	Land	Alternatives ^{a/}									
			A		B		C		D		E	
			Income	Land	Income	Land	Income	Land	Income	Land	Income	Land
<u>Hypothesis I</u>												
Upper	19.8	45.4	17.3	39.7	13.0	29.8	8.2	18.8	3.0	6.9	-	-
Intermediate	47.4	50.5	41.4	44.1	41.4	44.1	41.4	44.1	41.4	44.1	38.6	41.1
Subsistence	32.8	4.1	41.3	16.2	45.6	26.1	50.4	37.1	55.6	49.0	61.4	58.9
<u>Total</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>
<u>Hypothesis II</u>												
Upper	19.8	45.4	18.6	42.4	14.7	33.5	10.5	23.8	5.8	13.1	b/	b/
Intermediate	47.4	50.5	44.6	47.6	44.6	47.6	44.6	47.6	44.6	47.6	44.6	47.6
Subsistence	32.8	4.1	36.8	10.0	40.7	18.9	44.9	28.6	49.6	39.3	54.7	51.0
<u>Total</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>

Source: Joint ECLA/FAO Agriculture Division.

a/ See table 18.

b/ The upper group would be left with almost nothing.

/Table 21

Table 21

LATIN AMERICA (EXCLUDING ARGENTINA): DISTRIBUTION OF AGRICULTURAL
LAND EQUIVALENT, 1965 AND 1985

(Millions of hectares)

Income group	1965	1985				
		Alternatives a/				
		A	B	C	D	E
<u>Hypothesis I (constant prices)</u>						
Upper	103.9	127.8	96.0	60.5	22.2	-
Intermediate	115.5	142.0	142.0	142.0	142.0	132.3
Subsistence	9.4	52.2	84.0	119.5	157.8	189.7
<u>Total</u>	<u>228.8</u>	<u>322.0</u>	<u>322.0</u>	<u>322.0</u>	<u>322.0</u>	<u>322.0</u>
<u>Hypothesis II (improved prices)</u>						
Upper	103.9	136.5	107.9	76.6	42.2	b/
Intermediate	115.5	153.3	153.3	153.3	153.3	153.3
Subsistence	9.4	32.2	60.8	92.1	126.5	164.2
<u>Total</u>	<u>228.8</u>	<u>322.0</u>	<u>322.0</u>	<u>322.0</u>	<u>322.0</u>	<u>322.0</u>

Source: Joint ECIA/FAO Agriculture Division.

a/ See table 18.

b/ This group would be left with almost nothing.

/The figures

The figures for land distribution in 1985 in relation to the number of active persons in each group presented in table 22 by the population growth alternatives considered and in accordance with hypothesis I (gross total agricultural income grows at constant prices). Table 22 shows that the area of land equivalent per economically active person in the upper group will have to increase if the agricultural population remains the same as in 1965 (alternative A), in order to provide the additional income envisaged for this group under alternative A. Owing to the rise in land productivity, the agricultural area would grow proportionately less than income. As the agricultural population in the other two groups increases, the area in the hands of the upper group will be progressively reduced until it disappears completely in alternative E, which envisages maximum population growth. If the real growth rate for the agricultural population is from 1 to 1.5 per cent annually (as in alternatives C and D), the amount of land owned by the upper group would have to be reduced by 40 to 80 million hectares. If the active population in the upper group remains constant which is unlikely in view of the inroads on the land formerly held by them, the area of agricultural land equivalent per economically active person would be greatly reduced, while remaining a good deal larger than the average for the intermediate group. In this case, the traditional latifundia structure as such would disappear, but, even if a few large estates were to remain,^{36/} they would carry little weight within the total. As tables 20 and 21 indicate, the proportion of land held by the upper group would be 7 per cent less in alternative D, that is, just over 20 million hectares.

^{36/} If, for instance, the active population in this group were to decrease in proportion to the reduction in the over-all area owned by the group, the area per active person might remain the same.

Table 22

LATIN AMERICA (EXCLUDING ARGENTINA): DISTRIBUTION OF LAND
EQUIVALENT BY SOCIO-ECONOMIC STRATA, 1985

HYPOTHESIS I

Population group	1985					1965
	Alternatives					
	A	B	C	D	E	
<u>Subsistence</u>						
Total area (millions of hectares)	52.2	84.0	119.5	157.8	189.7	9.4
Economically active persons with land (millions) ^{a/}	6.8	10.9	15.5	20.5	24.6	6.8
Area per economically active person (hectares)	7.7	7.7	7.7	7.7	7.7	1.4
Remaining landless wage-earners (millions)	14.7	12.9	10.8	8.5	7.4	14.7
<u>Intermediate</u>						
Total area (millions of hectares)	142.0	142.0	142.0	142.0	132.3	115.5
Economically active persons (millions) ^{b/}	8.9	9.8	10.9	12.0	13.2	8.9
Area per economically active person (hectares)	16.0	14.5	13.0	11.8	10.0	13.0
<u>Upper</u>						
Total area (millions of hectares)	127.8	96.0	60.5	22.2	-	103.9
Economically active persons (millions) ^{c/}	0.6	0.6	0.6	0.6	-	0.6
Area per economically active person (hectares)	218.8	164.4	103.6	38.0	-	177.9

Source: Joint ECLA/FAO Agriculture Division.

a/ At the rate of 7.7 hectares per economically active person.

b/ Excluding skilled workers and employees.

c/ On the assumption that the economically active population in this group remains constant.

/As far

As far as the intermediate group is concerned, the agricultural area per active person would not be reduced unless the population began to grow at a rate of over 1 per cent yearly. It has been assumed that the total area in the hands of this group would be the same in all alternatives, since the group's share of total agricultural income would be constant (except in alternative E). With little or no population increase, the area per active person would be larger than in 1965. With a 1 per cent rate of population growth, it would be the same as in the base year, and, with an annual growth rate of 1.5 per cent, it would be reduced by roughly one hectare (approximately 10 per cent). In alternative E, which postulates a 2 per cent growth rate there is a sharper cut in area, as this group would have to reduce its share of income and, consequently, of landed property, in order to fulfill the targets set for the improvement of income levels in the subsistence group. If this situation were to occur, however, the trend of events would probably be similar to that envisaged for the upper group in that the population in the intermediate group would not increase at such a high rate, and the amount of land available per economically active person would be much the same as in 1965 or would be reduced less than is contemplated in table 22.^{37/}

The area that would remain in the hands of the subsistence group is a residual. Provided that the population does not increase (alternative A), the equivalent area available for this group would be sufficient to give the same number of smallholders as in 1965 an area similar to the current family-type holding (about 7.7 hectares of agricultural land equivalent). Consequently, the number of landless economically active persons in this group would be the same as in the base year. Even though the level of employment on the large and medium-scale estate rose slightly, there would still be a good deal of unemployment in rural areas.

^{37/} It should be remembered, however, that the anticipated rise in land productivity would bring in about 54 per cent more income per hectare than in 1965. Thus, even though the area per active economically person in this group were to decrease from 13 to 10 hectares (in alternative E), income would rise from 874 to 1,030 dollars a year (see table 18).

At first sight, it would seem over-optimistic to postulate an increase from 1.4 to 7.7 hectares (5.5 times as much) in the area available per economically active person when income would increase only about 2.7 times between 1965 and 1985.

The disparity, however, is more apparent than real. It must be remembered that much of the land to be given to the subsistence group would be new land opened up as the agricultural frontier was pushed forward, and that its productivity would be lower than that of the land now in use. There is also the fact that minifundia holders now obtain a large proportion of their earnings from wage work on bigger farms. If it is presumed that, upon receiving more land, the whole of the group's income would accrue from own-account farming activities, the additional land earmarked for the individual members would of course, be proportionately greater than the per capita area calculated simply in relation to income.

If the agricultural population increases, so will the amount of land corresponding to the subsistence group in accordance with the given target for per capita income. On the basis of an average area of 7.7 hectares per economically active person, as postulated in alternative B, and with a population growth rate of 0.50 per cent, nearly 11 million people would be given land, and the equivalent figures in alternatives C, D and E would be approximately 15, 20 and 25 million. There would, of course, be a corresponding reduction in the area owned by the upper group (see table 22).

These figures would include some wage-earners that are now landless. The number of wage-earners that would still be without land, and that would be mainly employed on the estates belonging to the members of the upper and intermediate groups, would decrease in direct proportion to the reduction in the agricultural area owned by the upper group. Their number would drop from 14.7 million in 1965 to 10.8 million in 1985 under alternative C, to 8.5 million under D and to 7.4 million under E. In the latter case, the wage-earners concerned would be solely those working on the farms owned by the intermediate group.^{38/}

^{38/} A small fraction might also work on the expanded holdings of the subsistence group, but it is impossible to estimate just how many because of the statistical difficulties involved.

It will be noted that the structure of the labour force changes considerably in the alternatives that postulate higher population growth. To take alternative D, for instance, which assumes an annual growth rate of 1.5 per cent, 20.5 million persons (70 per cent), out of a total of 29 million economically active persons in the subsistence group, would be own-account workers (with full-time work) and only 30 per cent would be wage-earners. This is an entirely different situation from that existing in 1965, when only 31 per cent of the economically active population in the group owned land and had part-time employment, while the remaining 69 per cent formed a wage-labour reserve, also employed on a part-time basis. Moreover, the productivity of wage-earners in 1985 would be a good deal higher than in the base year, according to alternative D, since the average number of hectares of agricultural land equivalent per worker would not only rise from 15 to about 19,^{39/} but average productivity per hectare of equivalent would climb approximately 50 per cent.

Under the hypothesis of improved prices, there would be a slight change in the situation. On the one hand, the area transferred to the subsistence group would be lower than in the former case because the redistribution of agricultural income would be less radical. On the other, fewer hectares would be required by each economically active person in the group in order to raise his income to the specified level (see table 23). The number of economically active persons to whom land could be given is therefore much lower than in the other alternative. According to this hypothesis, if the active population does not increase (alternative A), the land available for allocation to the subsistence group would be enough for about 4.2 million persons, but not sufficient for the group to attain the income target set for 1985, for which 6.8 hectares would be needed per economically active person. An appreciable number of minifundia holders would thus have to hire themselves out as paid labour for part of the time, and the absorption of the rural unemployed would undoubtedly be low. The situation envisaged in the other alternatives, however, would be the same as in hypothesis I.

^{39/} The total area held by the intermediate and upper groups is divided by the number of wage-earners that remain.

Table 23

LATIN AMERICA (EXCLUDING ARGENTINA): DISTRIBUTION OF LAND EQUIVALENT
BY SOCIO-ECONOMIC STRATA, 1985
HYPOTHESIS II

Population group	Alternatives					1965
	A	B	C	D	E	
<u>Subsistence</u>						
Total area (millions of hectares)	32.2	60.8	92.1	126.5	164.2	9.4
Economically active persons with land (millions)	6.8	8.9	13.5	18.6	24.1	6.8
Area per economically active person (hectares)	4.7 ^{a/}	6.8	6.8	6.8	6.8	1.4
Remaining landless wage-earners (millions)	14.7	14.9	12.8	10.4	7.9	14.7
<u>Intermediate</u>						
Total area (millions of hectares)	153.3	153.3	153.3	153.3	153.3	153.3
Economically active persons (millions) ^{b/}	8.9	9.8	10.9	12.0	13.2	8.9
Area per economically active person (hectares)	17.2	15.6	14.1	12.8	11.6	13.0
<u>Upper</u>						
Total area (millions of hectares)	136.5	107.9	76.6	42.2	-	103.9
Economically active persons (millions) ^{b/}	0.6	0.6	0.6	0.6	-	0.6
Area per economically active person (hectares)	233.7	184.8	131.2	72.3	-	177.9

Source: Joint ECLA/FAO Agriculture Division.

^{a/} This figure represents an average between the amount of land that would be received by 4.2 million beneficiaries under agrarian reform (6.8 hectares each, on an average) and the land that would remain in the possession of 2.6 million holders of minifundia (see text).

^{b/} See table 22.

/In alternative

In alternative D, which has been taken as an example, the total number of economically active persons owning land would be 18.6 million, or only 2 million less than in the other case.

These considerations suggest that any real improvement in the living levels of the rural masses must be brought about through the mass transfer of land, much of which will have to come from the property now in the hands of the big landowners. What must now be done is to examine the possible methods of organizing agricultural production under the new structures of land tenure and exploitation.

7. Organization and management of agrarian reform

The change in agrarian structures outlined in the foregoing sections would give access to the land to millions of rural families that now have no land at all or not enough, and would also radically alter existing labour relations in rural areas. Nevertheless, it would involve innumerable problems of various kinds, to which those in charge of planning and guiding the process should be fully awake, and for which appropriate solutions should be sought with due regard to the special characteristics of each country and of its different internal regions.

The main issues arising may be summed up under the following heads (not to be taken as listed in order of priority):

- (a) Methods of allocating the land to be transferred to beneficiaries under the reform, whether it derives from the expansion of the agricultural area or from redistribution of existing latifundia;
- (b) Systems of organizing beneficiaries;
- (c) Labour organization systems, which will enable agricultural workers who retain their wage-earner status to obtain real income increases in line with the objectives established;
- (d) Organization of internal markets and improvement of agricultural marketing systems, so that they may be reasonably accessible not only to agrarian reform areas, but also to unfavourably situated regions or those with marginal productivity, and so that farmers in general may receive a bigger share of the prices paid by consumers;
- (e) Selection of criteria for the tapping and allocation of available funds to cover the substantial investment and the

/additional working

- additional working capital that will be required both for the agrarian reform process itself and, in general, for the task of increasing agricultural production and productivity;
- (f) Policies and machinery for (i) training the thousands of technical personnel needed at all levels, and (ii) expanding and improving research and extension services, together with educational facilities for the rural population;
 - (g) Policies for the production and marketing of technical inputs which will facilitate their use in the quantities and on the lines required;
 - (h) Rural industrialization policies;
 - (i) Policies for the development of agricultural production in sectors unaffected by agrarian reform, designed to guarantee them the security they need if they are not to slacken their rate of mechanization or capital formation.

Some of these points will be discussed in the following pages, although - it must be repeated - in very general and summary fashion.

(a) Methods of allocating land

As already pointed out, there are many differences between the Latin American countries, and between the various internal regions of one and the same country, in respect of soil location, quality and use, ecological conditions, volume and quality of manpower, labour systems, etc.; and this necessarily implies that there cannot be a single pattern of agrarian reform, and that the types of farm emerging as a result of the reform process are also bound to vary widely.

In principle, it may be argued that the mere division of the land into innumerable small units farmed on an entirely individual basis is a costly process whose economic outcome is dubious. Such a procedure might mean too much relatively unproductive investment, a partial waste of land and irrigation water, under-utilization of expensive equipment, and, above all, the necessity of multiplying to a wildly exaggerated extent - with the inevitable consequences in the shape of inefficiency - the administrative, programming, marketing, financial and technical assistance services needed by the new cultivators. In the case of land used for stock farming - and it must be remembered that this will represent a large part of the additional farming area - fragmentation is completely incompatible with sound herd management.

/This does

This does not preclude the concession of individual deeds of ownership or farming rights. On the contrary, that will undoubtedly be the usual practice. But to grant individual deeds or rights is not the same thing as to hand over the individual and completely separate plots of land. What matters to the cultivator, in the last analysis, is the opportunity to obtain an adequate increase in his income through the hard work and know-how he puts into farming. For economic and technological reasons, the attainment of this objective is more feasible if his land forms part of a bigger farming unit, within which, of course he retains his proportional rights.

In many countries, co-operative associations have demonstrated the benefits deriving from programmes of action devised and implemented in common, without loss of that minimum of individual independence which is one of the essential characteristics of the peasantry. Accordingly, this might well be one of the most important organizational patterns for the Latin American agriculture of the future. A beginning might be made with simple bases of association (credit facilities, purchase of inputs, technical training, sale of produce, etc.), to be followed by more complex undertakings (for example, joint programming of production, use of community equipment, etc.), and by the formation of federations or other types of second-grade organizations through which more complex problems - such as marketing, establishment of processing industries, etc. - could be tackled.

In some instances - for example, in the case of poultry-rearing, pig-breeding, market gardening, etc. - the formation of individual family units might be justifiable. In others, the collective farming of State-owned land would perhaps be expedient.^{40/} In specific areas it is even conceivable that transfers might be effected on the basis of appropriate leasing regulations, supplemented by tax and credit provisions, whereby under-privileged groups could be encouraged to make use of abandoned or inefficiently farmed land.

In short, there are many possible organizational patterns, which may exist side by side in the same country or internal region, as circumstances

^{40/} For example, when specific cultivable land requires conservation or soil management techniques that could not be applied on a sound economic basis by groupings of peasant or by individual smallholders.

dictate. What it is important to stress is the principle of flexibility that should govern the formulation and implementation of agrarian reform programmes. It is clear from the foregoing remarks that co-operative patterns will be likely to predominate; but an essential prerequisite will be the gradual adaptation and motivation of the peasantry with a view to overcoming their natural leaning towards extreme individualism, which has its origins in their long years of physical and cultural isolation under the traditional systems of rural society.

A remunerations policy will also have to be decided upon to guarantee agricultural wage-earners their proper share in the benefits of technical progress and increased production. Unionization will be another essential instrument of the new institutional structure that will have to be firmly established in rural society. The achievements of such a few active unions of agricultural workers as exist in Latin America show how much more can be obtained by organized than by non-organized workers.

As long as the level of under-employment and unemployment is high, and recourse is still had to certain obsolete forms of engaging labour which involve some unpaid services, real wages will continue to be low. It is therefore essential that in conjunction with the adoption of radical measures designed to reduce unemployment by allocating land to a large number of agricultural workers, steps should be taken to ensure that those who continue as wage-earners can obtain and maintain satisfactory conditions in respect of minimum wages, regulations for work contracts, social security services, and so forth. Active unionization will facilitate the pursuit of this aim.

(b) Organization of markets

The advance of communications and transport facilities in Latin America has gradually made it easier for contact to be established and connexions made between the various areas and markets within each country. Undeniable as are the resulting advantages for the development and integration of the national economy, problems arise for some areas whose productivity is lower or whose geographical position is unfavourable, since they have to face growing competition from other parts of the country where the agricultural sector is more modern and dynamic, or which are more advantageously endowed with natural resources, or for which the sources of financing and technical assistance are more readily accessible. This tends to slow up the development

/rate of

rate of areas of the former type - which are usually those in which the majority of the unemployed and lower-income groups are concentrated - and to perpetuate and aggravate the lack of inter-regional balance in the country's development pattern.

Suffice it to mention in this context the acute difficulties with which agriculture is confronted in the Nordeste area of Brazil, as a result of the increasing market competition it has to face, both at the national level and within its own boundaries, from the supply originating in the Centro-Sul states. Much the same is true in Mexico of the states of San Luis Potosí, Querétaro, Hidalgo, México, Tlaxcala, Puebla and Oaxaca, where productivity and income indexes are far lower than in the rest of the country.

It would be an unwarrantable over-simplification of the case to recommend the formation of areas with a closed agricultural economy or the establishment of customs barriers between different parts of the same country as means of solving this problem. It can be tackled only by planning with an eye to the inter-regional balance of development and formulating programmes designed to reduce the disparities in productivity. There is a wide range of possible means to this end, including the establishment of centres for production and/or distribution of inputs at incentive prices in problem areas; the installation in such areas of industries which will imply real demand for locally produced raw materials, and the diversification and in some cases the zoning of production, perhaps even on a compulsory basis; credit and technical assistance campaigns; application of support price policies taking this problem into account,^{41/} etc.

It is of vital importance that the problems in question and their possible solutions should be taken into consideration both in the planning of agrarian reform in traditional agricultural areas and in the organization of new farm enterprises in areas recently brought under cultivation. Otherwise there might be a risk that the final outcome of the process would

^{41/} Discriminatory policies of this kind are being applied in respect of certain products or inputs in some countries of the region (for instance Mexico, Chile and Brazil itself).

be a giant-scale expansion of subsistence farming, and that the benefits of technical progress would be reaped almost entirely by a small minority of farmers.

(c) Technical training

One of the most serious obstacles in the way of agrarian reform programmes is the difficulty of finding, at the right moment, the technical cadres required at different operational levels. Strictly speaking, the problem is of a qualitative and financial rather than a quantitative nature; in other words, agrarian reform calls for specially trained technical personnel, and of the funds expended on it, a large proportion is not recoverable. In addition to the requirements inherent in land reform programmes themselves, others derive from the programmes relating to aid for rural workers' and producers' unions and associations to which reference was made above.

If the proposed targets are to be attained, therefore, a vigorous drive will have to be made to train technical personnel in the economic and social fields as well as in that of technology proper. As regards the former, academic qualifications are by no means sine qua non, since the functions of such personnel - management of co-operatives, union, leadership, etc. - can be fulfilled by capable members of the rural communities themselves, who can be trained in a relatively short space of time.

At the level of internal regions, not much background material is available for evaluation of the requirements in respect of agricultural specialists of professional standing and technical personnel at the intermediate level that would be entailed in reaching the targets established for increases in agricultural production and productivity. Accordingly, the tentative analysis presented below is inevitably highly conjectural. It is estimated that at the present time there are approximately 20,000 agronomists in Latin America and about 8,000 veterinaries.^{42/} Nothing is known of the number of intermediate technical personnel, but it is probably much the same as the number of agronomists. Disregarding for the moment the intrinsic needs of agrarian reform, it may be estimated that one university-trained professional extension agent is required per thousand workers, and that for every ten extension agents there should be six

^{42/} Estimate based on CIDA studies.

/professionals engaged

professionals engaged on other government programmes (research, conservation, administration, etc.), three professionals occupied in private-sector activities (commerce and farm management), and some twenty intermediate technical personnel. On this hypothesis, current requirements would amount to about 60,000 professionals and a rather larger number of agricultural technicians, i.e., twice and three times as many as are available at present.^{43/}

Technical personnel requirements in 1985, estimated on the same bases, will of course depend upon the growth rate of the economically active population remaining in the agricultural sector. Given alternative D presented in the model (see table 22 above, the working population in agriculture would by that time number approximately 45 million persons,^{44/} of whom about 20 million would be covered by agrarian reform programmes.^{45/} Consequently, by 1985 some 100,000 university-trained professionals and about 130,000 intermediate technical personnel would be needed. In other words, roughly 3,500 professionals and 5,500 technical personnel would have to complete their training each year. To judge from FAO estimates for South America,^{46/} there would be enough potential capacity for the requisite number of professionals to be produced, but the same could not be said of intermediate technical personnel. Only about two-thirds of requirements in this level could be met in 1985,^{47/} unless in the meantime additional efforts were made.

^{43/} The deficit would in fact be greater still, since no information is available on the proportion of professional and qualified technical personnel not engaged in activities connected with agriculture.

^{44/} Including Argentina.

^{45/} Under agrarian reform programmes, requirements are much greater. Taking into account the ratio determined by FAO Indicative World Plan (IWP), the extension services would need twice as many technical personnel as at present.

^{46/} FAO, Indicative World Plan.

^{47/} According to IWP estimates, net annual production potential in South America may be set at 3,000 agricultural experts at the professional level and 2,300 intermediate-level technical personnel. If the whole of Latin America is taken into consideration, it seems that only the latter would be in short supply, for assuming that the annual output of trainers was 3,000 only 80,000 technical personnel would be available by 1985.

(d) Improvement of technology

It has already been pointed out that the targets established imply an increase in agricultural productivity on a scale unprecedented in Latin America. The only way to achieve it is to improve farm techniques, and that in turn entails the strengthening and reorientation of research and extension activities in the various countries. Although there are various highly competent agricultural research institutes in Latin America, the relatively meagre results obtained in the shape of increases in unit yields in the region as a whole suggest that either the hard work put into research has not been guided by the Latin American countries' real requirements, or its findings have had no significant impact outside the walls of the institutes themselves, or both these sectors have operated in conjunction.^{48/} In future, therefore, much higher priority will have to be given to such activities, with due regard to certain special features of the region that are worth indicating briefly, as follows:

- (i) Efforts should be concentrated on objectives that are really of key importance, in order to counteract the tendency - common in Latin America, particularly in extension services to divert a considerable proportion of the available human and financial resources from direct technical training of farmers into educational activities which are often modelled on the experience of other regions and not properly adapted to the conditions prevailing in Latin America;
- (ii) An endeavour should be made to integrate the research conducted in the various Latin American countries, since up to now very little has been done by the research institutes to keep in touch with one another and exchange findings. For example, each country tries to develop its own varieties of seed,

^{48/} Admittedly, these are not the only factors affecting productivity and technical progress, but they are of basic importance.

- whereas much more rapid progress could be made if varieties whose merits had already been proven in a specific part of one country were tested in a similar area in another;^{49/}
- (iii) The prices paid by the farmer for technical inputs need to be reduced. In this respect the picture presented by Latin America, with few exceptions, is particularly gloomy. Input-output price ratios are appreciably tighter than those recorded, in comparable conditions, in countries with more highly developed agricultural sectors. It is useless to conduct technical development campaigns if the right quantities of inputs of the right quality are not available at the right time or at the right price. Concurrently, it will be essential to avoid the sort of extravagant spending which is common in the Latin American countries and does great harm to their economies. At the present time, a great deal of the technical inputs and equipment used in Latin America comes from industrialized countries and is designed to suit their own conditions. Much of the equipment is characterized by a degree of hyper-modernity that is unnecessary in Latin America and sometimes actually runs counter to the region's interests;^{50/}
- (iv) More intensive use should be made of credit as an instrument of technical promotion rather than as a mere financial mechanism. This implies the adoption of credit systems differing from those in common use as regards interest rates, amortization periods and securities. It is true that the region can point to various successful experiments in this field, but generally speaking, credit machinery has been designed to serve the latifundia and has been partly responsible for their survival;

^{49/} Recently, at the tenth FAO Regional Conference for Latin America, it was pointed out that so far not one of the genetic varieties of wheat developed by researchers in Argentina or Chile, had been used even on an experimental scale in the neighbouring country.

^{50/} For example, agricultural equipment whose cost is heavy because it contains highly automatized parts, which in effect mean the replacement of human labour, or greater comfort for the operator.

- (v) Everything possible should be done to make the introduction of improved techniques compatible with the attainment of employment objectives. In view of the population explosion, it is particularly important that agriculture should be able to offer productive work to a growing labour force. It will therefore be necessary to examine, in the light of the specific situation of the different countries, the alternative possibilities that may present themselves, since little is known on this subject and conflicting ideas often exist.

(e) Financing of agrarian reform

Undeniably, a process of change and development such as has been outlined here will entail the investment of substantial sums, in addition to the work of planning and organizing to which reference has been made. Unfortunately, the data available are insufficient for even a rough assessment of the amount of capital required for this purpose. It was therefore thought preferable to await the findings of current research on the cost of agrarian reform, instead of hazarding estimates which might prove to have incorporated gross miscalculations. Moreover, as has frequently been stated, the solutions applicable in each individual case may vary radically from one country to another, and, consequently, so may the funds required.

In these circumstances, only a few qualitative aspects of the question can be discussed. In the long run, the agricultural development process - including agrarian reform - should be self-financing.^{51/} But since the heaviest investment will have to be concentrated in its initial stages, a potent injection of capital from other sectors of the economy^{52/} or from external financing institutions will be needed. It is true that

^{51/} It may be estimated roughly that the coefficient of savings in the agricultural sector, which at present is approximately 10 per cent, should be raised to about 15 per cent if the objective of financial independence is to be attained.

^{52/} This would mean, up to a point, a reversal of past trends, since hitherto, owing to the prevailing income distribution pattern, agriculture has been a source of funds for the development of other sectors.

agrarian reform, by releasing income which could be partly transferred to the State and ploughed back into the process itself, might make some contribution to the necessary capital information. Unquestionably, however, additional sources of financing will have to be found.

One such source, not of a strictly monetary character, might be constituted by the utilization of unemployed labour in infrastructural and other projects essential for increasing production and productivity. The experience of other parts of the world suggests that programmes of this kind - which usually demand relatively little in the way of material resources - might prove a valuable means of supplementing internal capital formation efforts, and at the same time a more rational way of turning idle manpower resources to account.

One of the vital issues in this connexion relates to the proportion of its investment in agrarian reforms that the State should recover from the beneficiaries of the process. It is logical to assume that it should recover at least the value of its direct investment, since only thus can it be enabled to service the external loans it obtains for agrarian reform purposes and to maintain and expand the process itself. Naturally, no particular formula is advocated here. The relevant decisions will depend upon political, economic and social factors peculiar to each country. Compensatory payments to the former owners of the land, which will represent a significant component of the debt contracted by beneficiaries, should be based on tax assessments, or, at all events, on realistic quotations which do not involve exaggerated over-valuation.

Similarly, the most appropriate procedures should be established for the reimbursements and other payments that will have to be effected by beneficiaries under the reform. One possibility, for instance, would be for debts relating to direct investment and working capital (including interest payments) to be paid off in a specific number of instalments, while the land could be paid for through the tax system. If tax rates linked to the real production capacity of the land were established, incentives to increase productivity would be provided, on the one hand, and, on the other, recipients of land would be returning to the

community a fair proportion of the benefits obtained. In other words, the new producers would share with the rest of the national society the product of the sacrifice it had made to give them access to a new social, economic and political position.

A programme such as this, or any other that might be established, should be the subject of very careful study, since it would largely determine the new landowners' chances of becoming solvent producers without too much detriment to their levels of consumption, and the State's possibilities of forging ahead with the reform process for whatever length of time proved necessary.

8. Agriculture and urban development

The impact on urban development of the different possibilities with regard to agricultural development structure discussed in preceding sections will vary substantially in each individual case. Suffice it to recall the great variety in nature and scope of the problems that over-all development policy will have to face in seeking to improve the levels of living of the subsistence groups in the light of the various alternatives for urban and rural population growth.

Apart from promoting social justice - an objective that needs no justification here - improving the income levels of the great urban and rural masses would have a very stimulating effect on the development of any economy, especially on employment, as is made clear in other documents. It is important to note that improvements in income distribution, in line with the analysis in an earlier section, would cause changes in the structure of demand. The demand of the low-income groups would be in the main for such articles as clothing, furniture, kitchen stoves, sewing machines, simple household equipment, bicycles, radios, etc., and for more highly processed foods, most of which are produced by the more labour-intensive traditional or light industries, although a proportion of this group's income would be used to purchase more sophisticated consumer durables (television sets, refrigerators, etc.), which are characteristic of the demand of the higher income groups.

The upper income group, on the other hand, would devote a larger proportion of their income to more complex manufactures, which are usually capital-intensive and have a large import content.

In connexion with the agricultural sector in particular, something more must be said about the impact of agrarian reform on the industrial sector and its relations with other sectors of the economy.

It must be borne in mind that the agricultural sector is a major purchaser of inputs and equipment from industry. As the level of modernization is raised, with a view to increasing productivity per capita and per hectare to the levels and in the manner described above, the use of industrial inputs will increase proportionally, and the market for them will expand. For example, the consumption of fertilizers should increase from its current level of 1.5 million tons of NPK to at least 6 or 7 million tons over the next twenty years. Agrarian reform will thus enable a much larger number of farmers to benefit from modern technology, and their demand for intermediate and capital goods will tend to rise appreciably. Modern technology would become much more widespread, however, if all the vast technical and financial assistance that has to be provided were accompanied by a reduction in the real prices of this kind of input, which could be done by lowering their production and marketing costs, as was noted earlier. Hence, the kind of technology and scale of operation used in the industries producing these inputs will be of great importance in achieving this aim.

It has been seen that a modernization policy in one sector may have a decisive influence on the policy to be followed in another sector. This is also the case with regard to the production of consumer goods.

Of special importance in terms of the interdependence between agriculture and industry are the industries processing agricultural products. As income rises, the tendency of the population to consume a higher proportion of processed foods will also rise, even more so if income is distributed more evenly among the various geographical areas of the different countries of Latin America. The agricultural

/population itself,

population itself, precisely because it is scattered over large areas, will form a large new market for processed foodstuffs which, incidentally, should help to raise its current deficit level of nutrition.

If food-processing industries are situated close to their sources of supply, it should be possible to establish agro-industrial centres, to which other light industries, which are generally less demanding about their locations, and ancillary activities could be attached. This would help to reduce the concentration of industrial investment (and related activities), which so far has gone first to the large urban centres. Establishing such new development centres would also open up possibilities of reducing the cost of exploitation of some of the natural resources (minerals, energy and forest resources, etc.) which at present are considered to be inaccessible or too far away from the centre. The cost of the infrastructure that would have to be built would not be set against just one of these new activities, but against all of them and thus they would be more financially feasible.

Reducing the concentration of industrial investment would have advantages both for the cities and for agriculture itself. There is no point in repeating all that has been said so often about the problems of urban overcrowding and its effects on the physical and mental health of the urban population. Nor is it necessary to stress the advantages of more balanced regional development, which is covered in greater detail in another document. Suffice it to say that for the agricultural population, the establishment of industrial centres within the rural environment, linked into some way to agricultural activities, would help to raise the level of rural income and strengthen demand and over-all economic activity in rural areas.

The changes needed in the urban economy to ensure the success of agrarian reform programmes are not limited to the industries producing consumer or capital goods or agricultural inputs, but cover a wide range of activities by the State, by the commercial and financial sectors, and in fact by the community as a whole.

/Incorporating a

Incorporating a large segment of the population into the civic, cultural and economic life of the nation must result in a profound change in the whole system of human and institutional relations. However - and this must be emphasized - this kind of change cannot be viewed as the logical result of this process but must be carried out simultaneously with it, or even precede it, if it is to be completely successful. Simply superimposing a massive programme of agrarian reform on existing economic and social structures will only result in even greater distortions in the development process, or in increased resistance to change in rural areas, at the risk of frustrating from the outset the objectives of social, political and economic justice, and, in the final analysis, the aim of self-sustained development.

For all these reasons, it is essential that in economic, social, administrative and institutional planning, attention should be paid to the many factors involved in the relationship between urban and rural areas, some of which have been briefly outlined in these pages.

9. Agricultural development and Latin American integration

If, as noted above, the different sectors of the national economies have become more and more interdependent, it is no less certain that the relations between the various Latin American countries are following the same trend. Proof of this is that the last few years have witnessed the launching of the three major integration movements now in operation in the region, and the Declaration of the Presidents of America in which the Governments announced their intention of establishing a Latin American common market by 1985.

There is no country in the world that is or can hope to be entirely self-sufficient. On the contrary, as more progress is made along the road to development and the structure of production and consumption becomes more complex and diversified, foreign trade is called upon to play an increasingly important role. It would be possible, however, for Latin America to attain a higher degree of self-sufficiency on a regional basis, taking advantage of the diversity and wealth of its natural resources, although they are unevenly

distributed among the various countries. This would diminish the increasing drain on the balance of payments represented by agricultural imports from outside the region, which, as will be recalled, amount to over 600 million dollars annually. Further, agricultural integration would enable more effective and rational use to be made of the abundant natural and human resources and the relatively scarce capital of the Latin American countries. More specialization could be encouraged as a means of stepping up productivity and reducing production costs, thereby benefiting the many Latin American consumers.

It was stated earlier that intra-regional trade in agricultural commodities will have to increase appreciably in the next few years and that the region as a whole can hope to replace imports from outside the region on a substantial scale, so that in 1985 - according to the development hypothesis presented above - they would not exceed the absolute figure for 1965.

Nevertheless, some characteristics which are peculiar to the agricultural sector make it necessary to accord it special treatment. As has been repeatedly pointed out in this study, in most of the Latin American countries a very high proportion of the population is engaged in agriculture and has very low income levels; the high rates of rural unemployment and under-employment are a serious economic and social problem in nearly all rural areas. Moreover, although there is a certain degree of natural complementarity between countries on account of the different climates, soils and times for harvesting, many of them have a similar structure of production, with the same crops predominating but widely differing levels of productivity and production costs. These disparities may be due both to physical factors and to differences in the stages of technical progress, labour and tax systems, input costs, or in the national economic policies.

Table 24 presents average wholesale prices (expressed in dollars) of twenty selected agricultural commodities recorded in the eleven member countries of the Latin American Free Trade Association (LAFTA) for the five years 1962-66.

Table 24

LATIN AMERICAN FREE TRADE ASSOCIATION: WHOLESALE PRICES OF SELECTED COMMODITIES

(Dollars per ton; average 1962-66)

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Commodity	Argen- tina	Bolivia	Brazil	Colom- bia	Chile	Ecuador	Mexico	Paraguay	Peru	Uruguay	Vene- zuela
Wheat	51	101	78	197	77	129	90	80	77	59	83
Wheat flour	81	147	124	267	120	203	121	-	125	91	174
Unmilled maize	49	173	48	183	83	106	77	77	92	71	119
Paddy rice	71	72	108	-	78	-	-	91	97	-	135
Hulled rice	-	236	183	286	212	179	213	-	231	149	329
Malt barley	45	101	108	83	-	96	64	-	87	55	-
Red and black beans	-	-	158	551	220	317	195	-	248	-	306
White beans	96	-	174	431	218	278	159	-	284	426	300
Yellow potatoes	-	125	100	115	-	68	102	-	195	-	-
White potatoes	66	-	57	-	79	-	64	-	88	97	160
Refined sugar	197	170	128	162	233	150	117	-	101	208	198
Black tobacco	-	216	434	368	209	-	-	-	312	-	-
Cocoa beans	-	466	241	750	-	529	713	-	608	-	728
Parchment coffee	-	-	279	628	-	732	-	-	831	-	820
Bananas	-	-	42	59	-	29	-	-	66	-	68
Raw cotton	-	253	132	-	-	218	-	-	209	-	266
Cotton fibre	534	951	456	610	816	715	515	-	647	635	880
Prime beef	423	530	480	602	661	548	573	-	761	341	850
Liquid milk	48	168	52	127	74	108	-	-	134	86	223
Chickens (live weight)	585	799	406	866	709	814	-	-	722	-	744
Eggs	458	985	439	995	742	769	635	-	574	628	759
Butter	991	1 937	994	1 597	1 553	1 102	1 427	-	1 288	1 370	1 500
Sheep's wool	935	-	-	-	1 088	-	-	-	-	867	-

Source: Joint ECLA/FAO Agriculture Division, on the basis of information obtained directly from the various countries.

A dash (-) indicates that no data are available.

The sharp disparities in the prices of some commodities are striking. For wheat and maize, for example, the ratio between Argentina and Colombia was 1 to 4; for coffee it was 1 to 3 between Brazil and Peru, and it was the same for cocoa between Brazil and Colombia. In general, there was a difference in price of 100 per cent or more between at least two of the eleven LAFTA countries in all the commodities considered.^{53/} Admittedly, over- or under-valued exchange rates in the various countries may have accentuated these differences; but those were the rates actually used for foreign trade transactions in the various countries; consequently the comparison shown in table 24 is a legitimate illustration of the extremely unequal competitive position of many of these countries in the case of several important products. It will be noted, moreover, that in some cases the difference in absolute terms is many times higher than the transport costs involved.

Another fact which emerges from an examination of table 24 is the extraordinary variation from one country to another in the price relationships between the commodities listed. To facilitate this comparison, table 25 presents the same data in index form, with wheat equal to 100. It will be noted, for example, that while in Brazil the price of maize was nearly 40 per cent lower than that of wheat, in Bolivia it was 70 per cent higher; in Ecuador and Colombia the price of potatoes was about half the price of wheat, while in Peru it was 75 per cent higher; and the index for black tobacco in Brazil was three times higher than in Colombia.

It would seem, therefore, that agricultural integration in Latin America should be based on planned criteria rather than be allowed to result merely from the free play of market forces. The unrestricted opening up of domestic markets to all agricultural commodities might aggravate the unemployment situation existing in many parts of the region if the possible surpluses of one country where prices are lower were freely dumped on the markets of other countries, and if the latter were

^{53/} The only exception in table 24 is sheep's wool, but data on this commodity are available for only three countries.

Table 25

LATIN AMERICAN FREE TRADE ASSOCIATION: STRUCTURE OF WHOLESALE PRICES OF SELECTED
AGRICULTURAL COMMODITIES (IN DOLLARS): AVERAGE FOR 1962-66

(Index: wheat = 100)

Commodities	Argentina	Bolivia	Brazil	Colombia	Chile	Ecuador	Mexico	Paraguay	Peru	Uruguay	Venezuela
Wheat	100	100	100	100	100	100	100	100	100	100	100
Wheat flour	159	145	159	136	156	157	134	-	163	154	210
Unmilled maize	96	171	62	93	108	82	86	96	119	120	143
Paddy rice	139	71	138	-	101	-	-	114	126	-	163
Hulled rice	-	234	235	145	275	139	237	-	300	252	396
Malt barley	88	100	138	42	-	74	71	-	113	93	-
Red and black beans	-	-	202	280	286	246	217	-	322	-	369
White beans	188	-	223	219	283	215	177	-	369	72	361
Yellow potatoes	-	124	128	58	-	53	113	-	175	-	-
White potatoes	129	-	73	-	101	-	71	-	114	164	193
Refined sugar	386	168	164	82	303	116	130	-	131	352	239
Black tobacco	-	214	556	187	271	-	-	-	414	-	-
Cocoa beans	-	461	309	381	-	410	792	-	790	-	877
Parchment coffee	-	-	358	319	-	567	-	-	1 079	-	988
Bananas	-	-	54	20	-	22	-	-	85	-	82
Raw cotton	-	250	169	-	-	169	-	-	271	-	320
Cotton fibre	1 047	941	585	310	1 059	554	572	-	840	1 076	1 060
Prime beef	829	525	615	305	858	423	637	-	988	578	1 024
Liquid milk	94	167	67	64	96	84	-	-	174	146	269
Chickens (live weight)	1 147	791	520	440	921	631	-	-	938	-	896
Eggs	898	975	563	505	964	593	706	-	745	1 064	914
Butter	1 943	1 918	1 274	811	2 017	854	1 586	-	1 673	2 322	1 807
Sheep's wool	833	-	-	-	1 413	-	-	-	-	1 469	-

Source: Table 24.

A dash (-) indicates that no data are available.

unable to introduce the rapid adjustments in production required to employ the land and labour resources that had remained idle as a result of competition. It is true that a more accelerated development of industrial and commercial activities could help to absorb the displaced rural population; but, as has already been shown, technological progress in industry is resulting in the employment of fewer persons per unit of production. At best there would be temporary maladjustments which might cause serious social tensions, unless the integration scheme were to contemplate complete freedom of movement for people and capital, which could then shift to the most favoured areas. This requirement, however, is still far from being considered at a regional level.

For some products of lesser economic importance, perhaps a system of completely free trade could be arrived at shortly. The effects would not be too adverse and the adjustments that would have to be made in each case would be limited in physical and financial terms. A different approach should be adopted in the case of essential commodities, however. Intra-regional trade in these items would have to be the result of a deliberate process of co-ordinating and harmonizing production policies, technical progress, and investment, taking into account not only strictly economic factors but social factors as well. In this way the volume of trade could be envisaged beforehand, even if somewhat roughly, and this would avoid the distortions referred to above.

To initiate an orderly process of this kind, the Latin American countries must first have complete information about the position of each commodity. Since the problems differ from one case to another, the solutions are also likely to be different. It seems imperative, therefore, to prepare an integrated programme of studies on production, technology, consumption, foreign trade, domestic marketing systems, prices, national development policies, and prospects for increases in production of the main agricultural commodities, whether or not they are trade items at present.^{54/}

^{54/} The Joint ECLA/FAO Agriculture Division has already begun a systematic study of the position of some commodities in the LAFTA countries.

This preliminary review and analysis of existing problems should enable the Latin American Governments to adopt decisions that will gradually lead to the conclusion of agreements on trade, technical and economic co-operation, and the harmonization of production policies, which will naturally differ according to the characteristics of the product or group of products subject of the agreement.

Within this context, it would not seem to be too difficult for medium- or long-term trade agreements to be reached between those countries of the region which normally have exportable surpluses and those which will have to continue importing all or part of their requirements. Even in countries where imports must compete with domestic production, it might be possible to increase both under a system of combined purchases. Also in countries where the same commodity is produced at different latitudes and, therefore, the harvest times are different seasonal complementarity agreements might be considered by virtue of which certain products could be freely imported for a given number of months. This would make it possible to regulate supplies for the two markets throughout the year and thus avoid the disproportionate price increases which generally occur out of season. This type of trade is particularly feasible in the case of fruits and vegetables.

Public and semi-public marketing agencies can play a very active role in both these and other types of arrangements. In several Latin American countries these bodies have complete control of foreign trade in a number of important agricultural commodities. Permanent contact between these agencies and the extension of preferential treatment for products purchased in the region might effectively boost programmes for promoting trade and replacing imports from outside the region. A particularly important feature which must be considered in relation to these programmes is the large proportion of agricultural imports of some countries under special conditions or preferential arrangements.

Within the existing over-all context, special importance must be given to the co-operation that may be established in the fields of agricultural research and extension, technical training, and the control of plant and animal diseases and pests. A considerable saving could be effected in the amount which each country spends separately on these activities, or concerted action could be taken which is beyond the financial and technical possibilities of the individual countries, while much better use could be made of the scanty trained personnel resources of the region.